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# Section 1

# Introduction & Technical Data

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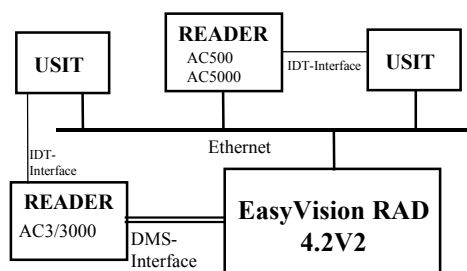
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## 1. INTRODUCTION

EasyVision RAD release 4.2V2 is a new acquisition system for X-Ray images exposed on Fuji Imaging plates and read out by Fuji readers and an image processing system with printing capabilities as well. With this new hardware and software generation readers connect with both local parallel (DMS) interface and via Ethernet to an EasyVision RAD.



Moreover the EasyVision RAD 4.2V2 supports multi reader configurations with:

- 1 DMS Reader
- n Network Readers

dependent on the performance of the hardware used.

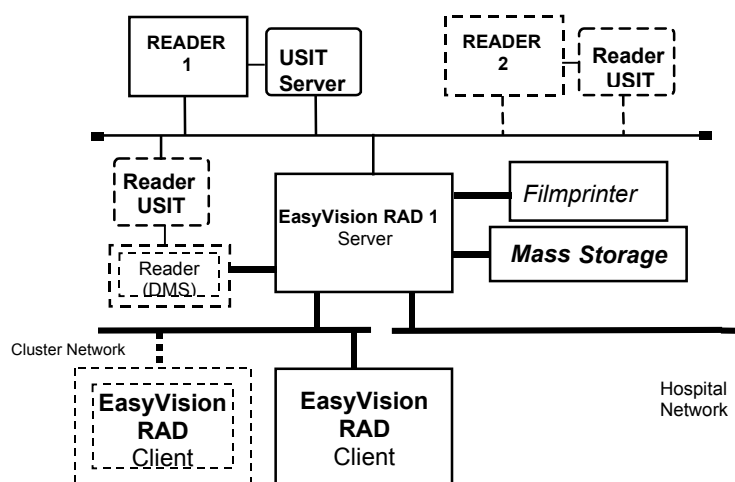
This way, for one or more readers including USITs, a single EasyVision workstation may be sufficient.

### The Single User Workstation

If there is only one EasyVision connected to one or more readers/USITs, the situation is like that before release 4.2. To differentiate between such a single EasyVision RAD and those in a cluster configuration, we call the single system a *Single User Workstation*.

### The EasyServer

Within an EasyVision RAD cluster, the EasyVisions use a common place to store their images. The system which does this is called the *EasyServer*. It controls the configuration of the cluster by controlling the software licenses, it handles the import from modalities, the printing to film, and all communication outside the cluster, for instance with the archive, external DICOM databases, or other clusters and workstations of other vendors.



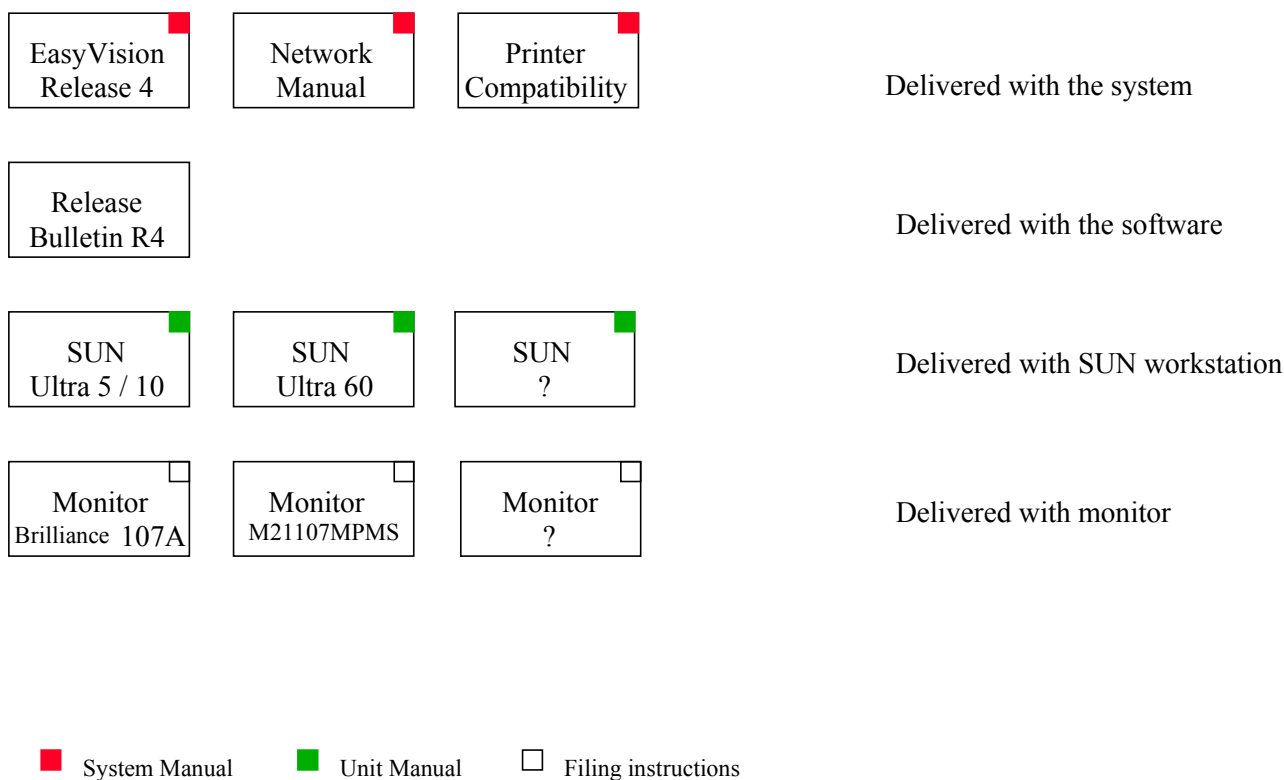
**The Workspot (Client)**

The *EasyServer* makes all images available to all EasyVisions in the cluster. The EasyVisions which also run the RAD applications (the *Workspots*) don't have an own image database and use the image database of the RAD server. The hardware configuration of the Workspot may vary from an UltraSparc 60 with lots of memory for fast and intensive image postprocessing, to a PC with a Java enabled Web Browser for basic image viewing.

**1.1. ABOUT DOCUMENTATION STRUCTURE**

This manual describes the EasyVision Release 4 architecture with its variety of hardware components. With the introduction of Release 4 a new documentation structure has been set up. From now on a system approach is chosen to deliver the appropriate documentation with the ordered configuration.

## Documentation Structure EasyVision Release 4



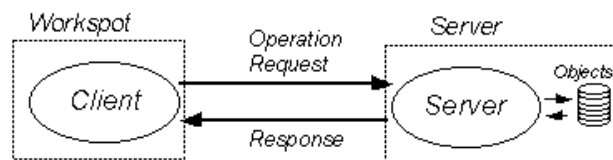
## 1.1. TECHNOLOGY

Up to now EasyVision products are mostly sold and used as "stand alone" workstations: The information (data) that is used by the user during the work on an EasyVision, normally resides on the EasyVision itself (in the database of the EasyVision).

Data can be imported from other sources (modalities or other workstations) and stored in the EasyVision database for use. Very often, the source(s) is (are) very determined, and (because of the modality-orientation of the EasyVision products) have a dedicated link to the EasyVisions (this can be a small, separate network also).

EasyVision Release 4 is based on a client/server computing technology. This means a different configuration will appear: Users on a workspot, use information that resides in a database on a central server and is received from a larger variety of sources.

### *Client / Server Concept*



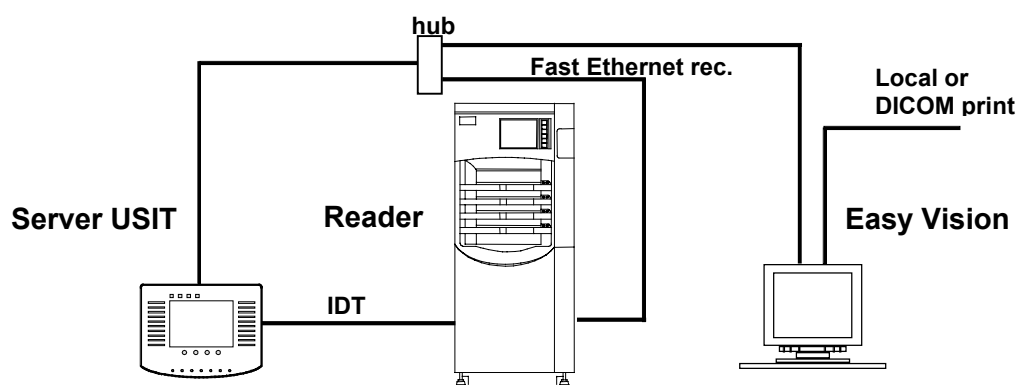
**Figure 1: Client/Server Concept**

### 1.1.1. SYSTEM LEVEL DESCRIPTION

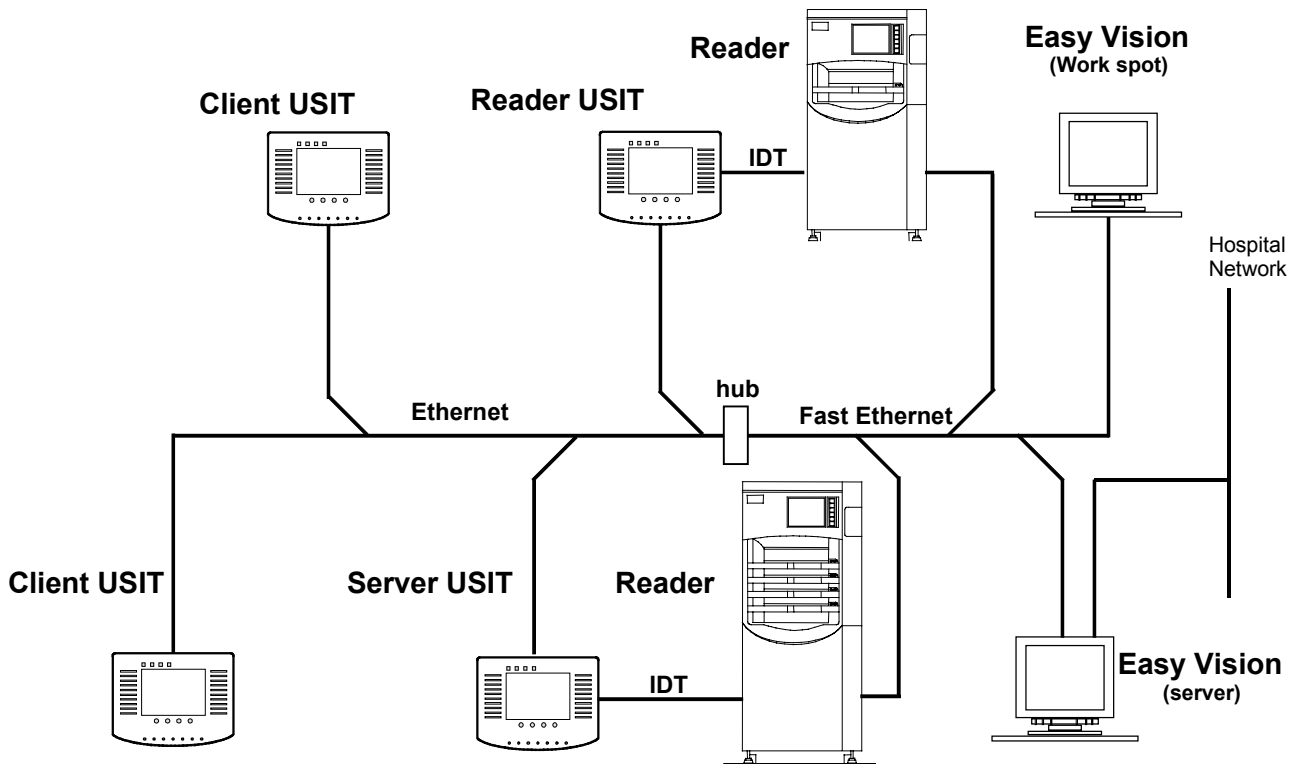
On system level two different kind of configurations are possible:

- standalone system
- server system and workspots

**Standalone configuration:**



**Figure 2: Standalone configuration**

**PCR Cluster configuration:****Figure 3: PCR Cluster, Multi Reader, Multi Terminal Configuration****1.2. TOOLS**

To remove and replace EasyVision Release field replaceable units (FRUs), you will need the following tools and materials:

- Standard toolkit
- Anti-static discharge kit
- Service PC + null modem cable (25pin) for back-up of configuration files.  
See Remote Service Manual for pin layout)
- Densitometer for laserprinter (e.g. X-Rite 331)
- Reflection densitometer for paperprinter (e.g. X-Rite 400)
- Hardcopy Unit test box
- Printer test tool
- Monitor maintenance kit
- Multimeter.

Also useful:

- Pallet truck

## 2. VERSIONS

The new PCI based systems deviate on several point from the Sbus based systems.

	PCI	
<b>Workstation enclosures</b>	Desktop Tower	Ultra 5 Ultra 10, Ultra 60
<b>Maximum operating temperature</b>	40 °C 40 °C	Ultra 5, Ultra 10 Ultra 60
<b>Internal disk/cdrom controller</b>	EIDE SCSI	Ultra 5, Ultra 10 Ultra 60
<b>Operating System version I/O bus</b>	Solaris 2.6 PCI	

### 2.1. PRODUCT

EasyVision RAD Release 4.2V2Lx

### 2.2. MANUAL

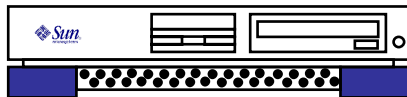
Service Manual EasyVision Release 4  
12NC: 4512 984 22361  
Version (99.0) see page 2.1 of manual  
First edition

### 2.3. COMPATIBILITY

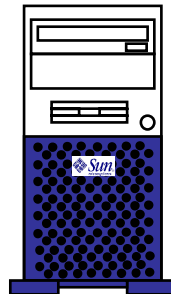
See Release Bulletin EasyVision RAD Release 4.2.V2. for compatibility list.

See Service Manual System - Imager Compatibility R4.2.V2 for printer compatibility list.

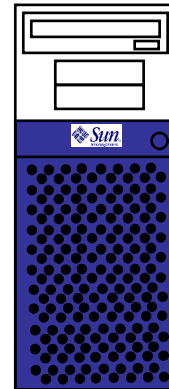
### 3. COMPUTERS



Ultra 5



Ultra 10



Ultra 60

Ultra 5: The SUN Ultra 5 is the entry level PCI based UltraSPARC workstation/server providing Ultra Power at the same cost as a PC

Ultra 10: The SUN Ultra 10 is a single processor PCI based workstation/server using the UltraSPARC-II 64-bit architecture. The system has a PC style mini-tower layout.

Ultra 60: The SUN Ultra 60 is PCI based workstation using the UltraSPARC-II 64-bit architecture. The system has a PC style mini-tower layout and is functionally equivalent to the Sbus based Ultra 2 workstation.

#### 3.1. OVERVIEW SUN STATION CONFIGURATION

	Ultra 5	Ultra 10	Ultra 60
<b>onboard SCSI-interface</b>	no	no	Ultra SCSI, 40 MB/sec
<b>IDE-interface</b>	EIDE, 33 MB/sec	EIDE, 33 MB/sec	No
<b>Ethernet-interface</b>	10/100 Mbit / sec	10/100 Mbit /sec	10/100 Mbit /sec
<b>Min memory</b>	256 MB (2x128)	256 (2x128 MB)	256 MB (4x64MB)
<b>Max. memory</b>	384- /512 MB	384-/512-/768 MB	512-/ 768-/ 1024 MB 768-/ 1280- / 1792 MB
<b>Memory module</b>	64-/ 128 MB	64- / 128- / 256 MB	64- / 128 MB
<b>Memory bank config.</b>	2 banks x 2 slots	2 banks x 2 slots	4 banks x 4 slots
<b>Internal disk</b>	EIDE, 4.3 GB	EIDE, 9.1 GB	Ultra-SCSI, 9.1 GB (360 MHz) 4.3 GB (300 MHz)
<b>Internal CDRom</b>	EIDE, 24x	EIDE, 24x	No
<b>External I/O slots</b>	3x PCI	4x PCI	4x PCI
<b>Framebuffers</b>	Yes, 8 bit	Yes, 8 bit	No
<b>UPA slot</b> (for 24 bits framebuffer)	no	Yes, 1	Yes, 2

**Table 1: Overview system configuration**



## 4. EASYVISION CONFIGURATIONS

### 4.1. STANDALONE CONFIGURATION

entry level	Ultra 5	270 MHz
advanced	Ultra 10	300 MHz
turbo	Ultra 60	360 MHz

#### 4.1.1. PCR STANDALONE CONFIGURATION

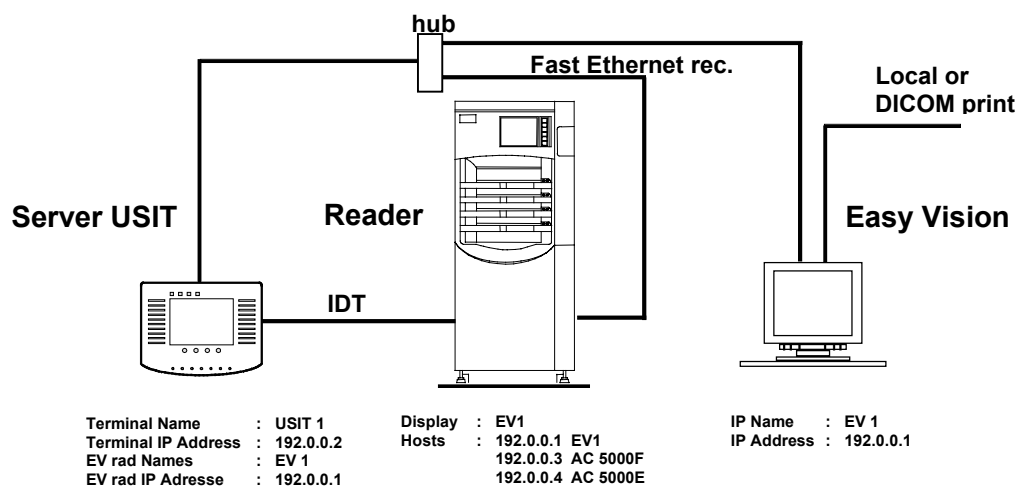


Figure 4: PCR standalone Configuration

Notes: This configuration requires additional hardware (HUB)  
 The UltraSPARC has an onboard 10/100 Mbit ethernet interface.

#### 4.1.2. CLIENT / SERVER PCR CONFIGURATION

For the server system computing power two classes are specified:

entry level	UltraSPARC 10	300 MHz
advanced	UltraSPARC 60	360 MHz

For the workspot computing power three classes are specified:

entry level	Ultra 5	270 MHz
advanced	Ultra 10	300 MHz
turbo	Ultra 60	360 MHz

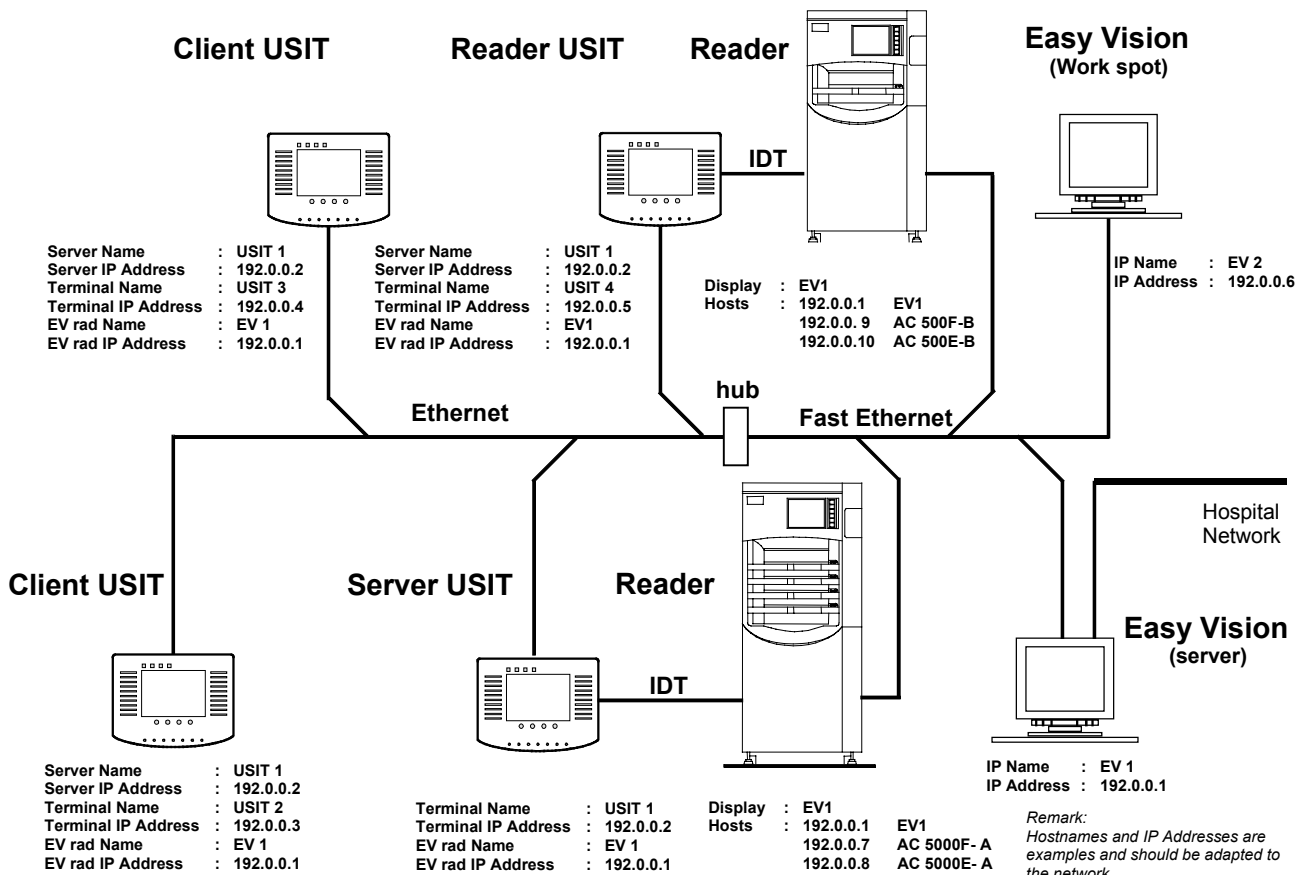


Figure 5: PCR Server-Client Multi Reader Multi USIT System

Notes:

An optional single 10/100 Mbit ethernet interface card is needed to connect to hospital network  
 This configuration requires additional hardware (HUB) and may be used to connect further EasyVision RAD clients and USITs.  
 The UltraSPARC has an onboard 10/100 Mbit ethernet interface.  
 The maximum length of the network cables is *100 meters*.

## 5. NETWORK CONNECTIONS

Building blocks to build a network, like hubs, switches and other related parts, are **NOT** part of the EasyVision Release 4 delivery. These parts have to be purchased locally, however, the manuals: Planning Reference Book Networking and the system manual Networking will advice to install a network.

### 5.1. CLIENT SERVER CLUSTERS

In this cluster concept two networks are determined.

- network, which is based on: 10 / 100 Mbit Base-T(X) ethernet.
- network, which is based on: (preferred) 100 Mbit Base-T(X) ethernet.

## 6. SAFETY REQUIREMENTS

### 6.1. ELECTROSTATIC DISCHARGE

For your protection, observe the following safety requirements:

- Follow all cautions, warnings, and instructions marked on the equipment.
- Ensure that the voltage and frequency rating of the power outlet matches the electrical rating labels on the system.
- Use properly grounded power outlets.

To protect both yourself and the equipment, observe the safety precautions listed in the following table:

Item	Problem	Precaution
AC Power Cord	Electric shock	Unplug the AC power cord from the wall socket before working on the power supply
	Grounding	Leave the AC power cord plugged into the wall socket when replacing drives, DSIMMs, chips or the system board. This provides a grounding path for the wrist strap, which must be attached.
Wrist strap	Electrostatic discharge (ESD)	Wear a wrist strap when handling printed circuit boards, drives or other components.
ESD mat	ESD	An approved anti-static mat provides protection from static damage when used with a wrist strap. The mat also cushions and protects small parts attached to the printed circuit boards.
Printed circuit boards		Handle a printed circuit by its edges only. Store boards in an anti-static bag.
Cover	System damage and overheating	Replace the cover after working on the system.
Sbus slot filler panels		Install filter panels in all unused Sbus openings. Openings on the rear of the system board reduce the cooling capacity of the system.
MicroSPARC chip heat sink	Heat, burns	Do not touch the heat sink on the microSPARC chip. The heat sink can be hot enough to cause burns.

## 6.2. ELECTROSTATIC DISCHARGE (ESD) REQUIREMENTS

The system chassis power must be switched off, and the AC power cord must remain plugged in to ensure a proper ground.

To minimize electrostatic discharge, observe the following precautions:

- Hold the system board, SBus cards, DSIMMs, or system components only by the edges.
- When removing a board, card, or module from an antistatic bag, lay it on an antistatic surface such as a ESD mat, an antistatic bag, or a disposable antistatic mat.
- Do not place the boards, cards, or modules on an unprotected surface. Use a cushioned antistatic mat or antistatic bag. Connectors and components have very thin pins that bend easily.
- Do not use an oscilloscope or VOM (volt-ohmmeter) probe on the components. The soldered pins are easily damaged or shorted by the probe point.
- Transport boards, cards, or modules in an antistatic bag.
- Always wear an antistatic wrist strap connected to a metal surface on the chassis when working on system components and parts.

## 7. EASYVISION TECHNICAL PRODUCT DATA

### 7.1. FRAMEBUFFERS

	Color			Greyscale
	PseudoColor PGX <sup>(+)</sup>	Pseudo Color PCI/PGX <sup>(+)</sup>	TrueColor UPA/FFB	MD2/PCI
Ultra 5 (3x PCI only)	Onboard*	1x	No	1x
Ultra 10 (4xPCI + 1x UPA)	Onboard*	3x	1x	2x
Ultra 60 (4xPCI + 2x UPA)	No	No	2x	2x

- The Ultra 5 and Ultra 10 configuration have an onboard framebuffer which can not be removed.
- EasyVision can not handle a mix of different types of framebuffers.

### 7.2. MONITORS

Framebuffer type	Display matrix: 1280 x 1024 Landscape oriented		
	Color Monitors		Greyscale monitors
	17" Color	21" Color	21" Greyscale
Pseudo Color (PGX <sup>(+)</sup> ) single head	Yes	Yes	Yes,
True Color (FFB) single head	Yes	Yes	Yes,
Greyscale (Md2) dual head	No	No	Yes

### 7.3. OPTICAL MEDIA DRIVES

EasyStore OD Drive	EasyStore CD-R Drive
Pioneer DE-UH710 600MB	Philips CDD 2600/3600

## 7.4. MEMORY BANK CONFIGURATIONS

### Ultra 5

	Slot 1	Slot 2
Bank 1	128	128
Bank 2	128	128

### Ultra 10

	Slot 1	Slot 2
Bank 1	128	128
Bank 2	128/256	128/256

### Ultra 60

	Slot 1	Slot 2	Slot 3	Slot 4
Bank 1	32	32	32	32
Bank 2	32	32	32	32
Bank 3	64/128	64/128	64/128	64/128
Bank 4	64/128	64/128	64/128	64/128

## 7.5. CONNECTIVITY

Connectivity	SCSI	parallel (DMS)	parallel 3M Interf.	parallel printer	Straight Ethernet
USIT					10/100 MBit
AC500/5000					10/100 MBit
AC3/3000 PCR9000 (DMS)		X			
Printers 3M Interf.			X		
Printers DICOM					10/100 MBit
Printers SCSI	X				
Printers postscript				X	

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## Section 2

## Installation

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## 1. WHAT IS DELIVERED

<u>Ultra 5 / 10 / 60</u>	Internal hard drive Memory Onboard PGX framebuffer Color (17" / 21") / greyscale (21") monitors Keyboard + mouse Cdrom reader Floppy drive	
<u>Optional</u>	Memory Extension HardCopy Unit Card Ethernet card (Quad / Single) PGX card (Pseudo color) Md2 (Grey scale) Creator card (True color) Ultra 10/60 only Twin SCSI Card	
<u>Peripherals</u>	Image disks EasyStore (Optical Disk) EasyStore ( CD-Rec)	PTI 2 PTI 2 PTI 1

# IMPORTANT !!!

The main part of this section describes the hardware installation per system. This can be a standalone EasyVision, a Server or a Workspot! Look at the commercial order what is appropriate for your environment.

For of a client/server environment installation, see chapter 6.1.7 Client / server.

## 2. PERSONEL

The total installation can be done by just one person.

## 3. INSTALLATION TIME

### 3.1. EASYVISION IN STAND-ALONE SYSTEM

Stand-alone: 8 hours

The total installation of a stand-alone EasyVision can be done within eight hours. Even the installation of a small network (e.g. 3 systems close to each other) can be completed within 8 hours.

### 3.2. CLIENT / SERVER EASYVISION

Server: 8 hours

Client: 4 hours

## 4. TRANSPORT LOCKINGS

There are **NO** transport lockings for disk-, DOR- and CD-ROM drive(s).

## 5. PHYSICAL INSTALLATION

The software has been installed at the factory. The software installation keeps track of the SCSI chain configuration. For this reason it is very important to build the same hardware configuration as assembled in the factory. The SCSI chains on the SUN and corresponding peripheral cabinets are labeled with stickers (SCSI-A, SCSI-B or SCSI-C).

**You must connect the factory defined SCSI chain!!!**

### WARNING

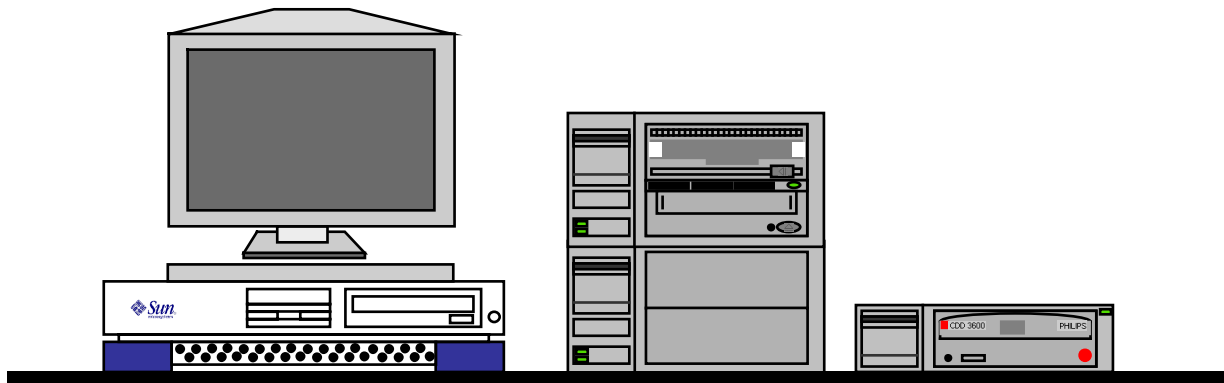
If the SCSI chain changes for any reason (e.g. an option) the OS and AS software must be reinstalled!

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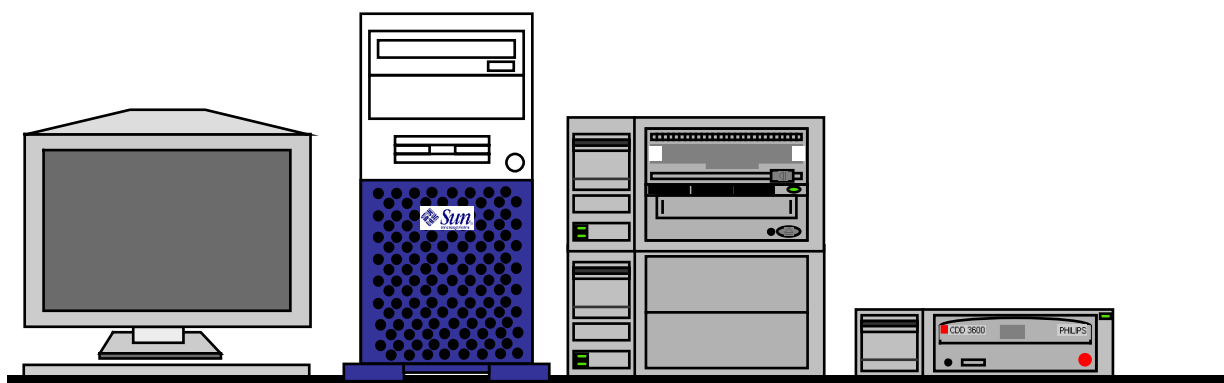
### 5.1. DESKTOP VERSION

- In a desktop configuration all separate components of the system should be placed on the hospital table
- Place Sun UltraSPARC on top of the hospital table.
- Place Peripheral-2 Cabinet(s) next Sun UltraSPARC.
- Place Monitor(s) on top of Sun UltraSPARC.
- Place the Peripheral-1 cabinet, if present, next to or on top of the Peripheral-2 Cabinet.
- Place Sun Keyboard within reach on the table.
- Place Mouse + Mouse pad within reach on the table.
- Place Dials unit within reach on the table.
- Place Dials power supply behind the Sun UltraSPARC.
- Place modem behind the Sun UltraSPARC.
- Place the mains distribution unit within reach on the table. The mains distribution unit contains the system power on/off switch.

#### Example Ultra 5:



#### Example Ultra 10 / 60:



#### **NOTE**

*You are free to choose another position, but keep track of the SCSI cable lengths (see chapter 7.1 SCSI-chain configurations)*

## 6. CABLING

See Z drawings of appropriate SUN UltraSPARC;  
See also the connection diagram PCR system AC500/AC5000

### NOTE

*Check all external and internal interface cables (e.g., the SCSI cable to the image hard disc, CD-ROM, DOR), as they may have moved during transport.*

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### 6.1. JOINING CABLES & CONNECTORS

#### 6.1.1. MONITOR CABLES

Connect the video cable from the monitor to the Sun UltraSPARC video connector.

Connect the monitor power cable to the power distribution unit.

#### 6.1.2. KEYBOARD & MOUSE CABLING

Connect the Sun keyboard cable to the SUN keyboard connector.

Connect the mouse cable to the keyboard. The left and right hand connectors of the Sun Keyboard are identical.

#### 6.1.3. NETWORK CONNECTION

A network kit or cable (for thicknet or Twisted Pair, 5m long) is only delivered with EasyVision when ordered, or during pre-installation phase otherwise you should obtain this locally.

You can connect EasyVision to the network in two ways:

- via an AUI connection (thick ethernet);
- via a twisted pair (TP) connection.

##### Twisted Pair Connection

Connect a twisted pair cable between the twisted pair connector on the SUN SPARCstation and a twisted pair hub or wall connection.

For further information about Ethernet refer to the Service Manual EasyNetWorking.

#### **6.1.4. NETWORK IP- READERS (FUJI AC500/AC5000)**

Connect the readers Network port 'CPU 90F-LAN' at the rear side of the reader with a STP cable (RJ45) to a port of a local hub or to a wall connector if the PCR system will be integrated into a hospital network. Ask the network administrator for a proper wall outlet to connect with.

#### **6.1.5. IP- READERS WITH PARALLEL INTERFACE (DMS) (AC3/AC3000/PCR9000)**

Connect the Reader interface cable (DMS) to the PCI reader interface connector at the EasyVision RAD (Sun Ultra X computer) and the DMS interface connector at the reader.

If the EasyVision RAD has been upgraded with a PCI Reader Interface board boot the EasyVision with the boot command:

**boot -R**

and start the application. The EasyVision RAD doesn't have to be configured manually. The system detects at startup time the PCI Reader Interface board loads the interface driver and starts the reader server.

#### **6.1.6. USIT (USER TERMINAL)**

- Connect the network ports of all USIT PCs (server/client) to ports of a local network hub or to wall connectors if the PCR system will be integrated into a hospital network.
- Connect the serial IDT cable to the serial port 1 of the USIT server PC (male) and to the IDT connector (female) of the IP Reader.

Refer to the respective service manuals of the readers and user terminal for proper connecting these devices.

For configuring these devices refer to the respective Release Bulletins.

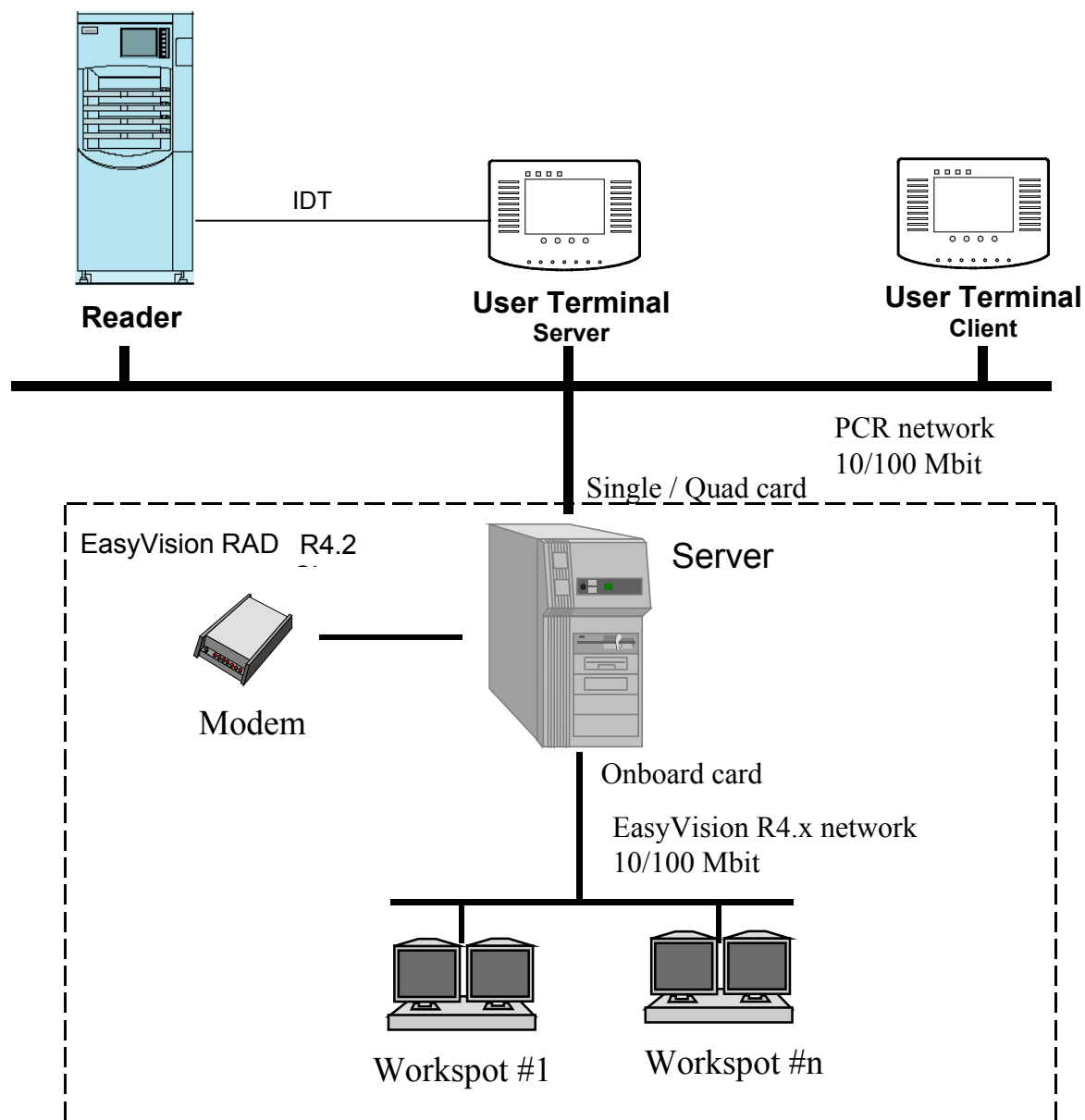
#### **NOTE:**

If in an installation other network standards than Twisted Pair are going to be used (i.e. Thinnet=10Base2, with 50 Ohm coax cable) refer to the manual EasyNetworking (Order No. 4522 983 66772) which is part of the PCR system documentation. Find in tis manual the rules to be kept for proper network design and installation in a hospital environment.

### 6.1.7. CLIENT / SERVER NETWORK CONNECTION

See Z drawings for cable diagrams.

Example:



### 6.1.8. ETHERNET LOOPBACK CONNECTOR

The loopback connectors serves two purposes.

- If a network is not connected to EasyVision, connect the loopback connector to the Ethernet connection at the end of the adaptor cable. This suppresses the UNIX message 'no carrier' (to console).
- Diagnostic purpose in Forth Diagnostics, see UltraSPARC Unit Manual.

#### **NOTE**

*In case of a Single/Quad Ethernet card: The unused controllers must have an Ethernet loopback connector connected*

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### 6.1.9. LASER HARDCOPY UNIT INTERFACE CABLES

The Laser HardCopy Unit (HCU) is connected to the EasyVision HCU split cable by a DATA and CONTROL cable (SUB-D 37p connectors). Connect the Data and Control cables.

#### **NOTE**

*Ensure that the correct connections have been made for the DATA and CONTROL cables. Interchanging these cables may **destroy** the S-bus hard copy interface.*

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Refer to the chapter "Connecting a Printer" in this Section 2.



### 6.1.10. MAINS CABLES

Fit the correct mains plug to the mains cable of the power distribution unit provided. A couple of mains plugs are delivered with the system but if the correct one for your environment is not there, you will have to obtain one locally. The EV DeskTop is delivered with separate Mains Distribution Unit as shown below. The EV Trolley and Combi Trolley have the Mains Distribution Unit built.

- Connect the mains cable between the SUN and the power distribution unit.
- Connect the mains cable between the peripheral cabinet and the power distribution unit.
- Connect the mains cable between the Monitor and the power distribution unit.
- Connect the mains adapter for the dials unit to the power distribution unit.
- Connect the mains cable to a mains wall socket. Ensure that a proper earth connection has been made between the system and the wall socket !
- The Laser HardCopy Unit (HCU) power cable may now be connected to the mains supply (if relevant).
- **NOTE**  
Make sure that the HCU has been connected to the same mains distribution point as the EasyVision. This is important to protect both the HCU interface of the EasyVision RAD and the the interface in the HCU from voltage differences dangerous for the electronic interface components.

### 6.1.11. MODEM

#### Loopback Connector:

Normally, a serial port loopback connector is connected to serial port B (rear of SS-5/ Ultra 1 /2). If you want to connect your service PC to port B:

1. Boot the system.
2. Remove the loopback connector.
3. Connect your PC.

#### Modem:

Install the modem on serial port B with the delivered modem cable. In case of a modem the serial port B loopback connector must be left out.

110V Wall socket

220V Distribution box (furniture/desktop)

#### **NOTE**

*In case of an Ultra 5 / 10 the serial port connector is a 9p socket*

---

### 6.2. CABLE RELIEF

Relieve the power cable, transceiver cable and hardcopy cables with tie-raps or flexible cable wrapper delivered.

## 7. PERIPHERAL CABINETS

### CAUTION

*The last PTI cabinet in each SCSI Chain must be terminated with a loopback connector.*

### CAUTION

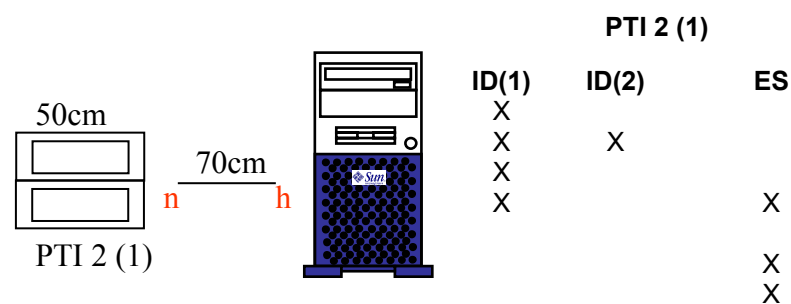
*If the SCSI chain configuration has been changed, the OS and As must be installed*

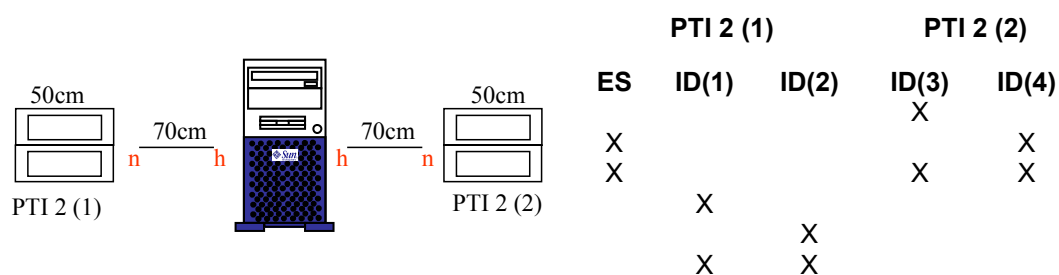
### 7.1. SCSI-CHAIN CONFIGURATIONS

Abbreviation	Device	SCSI
ID(1)	Image Disk	Wide SCSI (68 pin)
ID(2)	Additional Image Disk 1	Wide SCSI (68 pin)
ID(3)	Additional Image Disk 2	Wide SCSI (68 pin)
ID(4)	Additional Image Disk 3	Wide SCSI (68 pin)
ES	EasyStore (DOR)	Narrow SCSI (50 pin)
CD-Rec	EasyStore (Cd-Rec)	Narrow SCSI (50 pin)
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <math display="block">\frac{70\text{cm}}{h \quad n}</math> </div> <div> <p>h: 68p UHD (Ultra High Density)</p> <p>n: 68p FW (Fast Wide)</p> </div> </div>		

#### 7.1.1. ULTRASPARC 5/10 PTI 2 CONFIGURATIONS

##### Desktop:

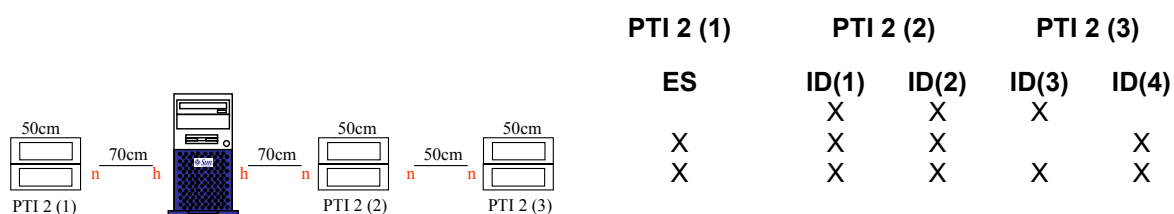




### Configuration 2

#### NOTE

*In case of 4 image disks, you may use 1 SCSI chain (See right hand side of configuration 3)*



### Configuration 3

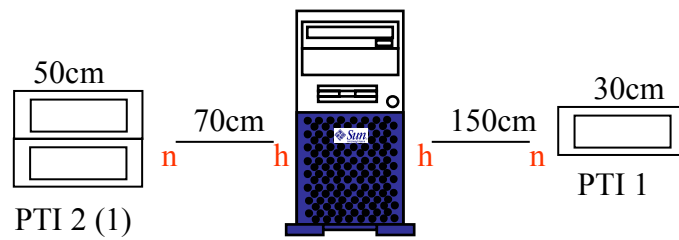
#### NOTE

If not initial installation, a 150 cm cable must be ordered

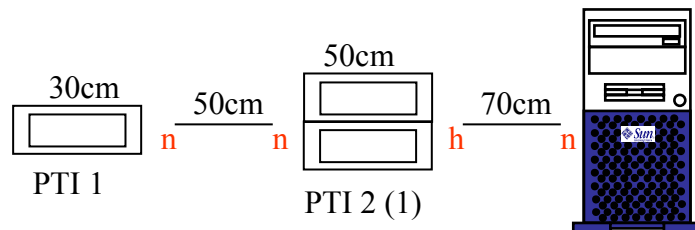
### 7.1.2. ULTRASPARC 5/10 PTI 2 + PTI 1 CONFIGURATIONS

#### Desktop:

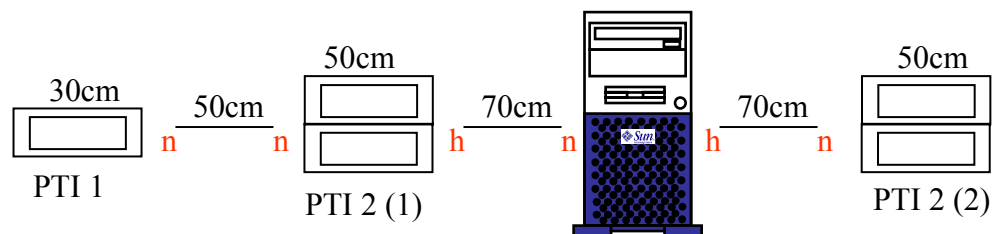
##### Configuration 1 + CD-Rec



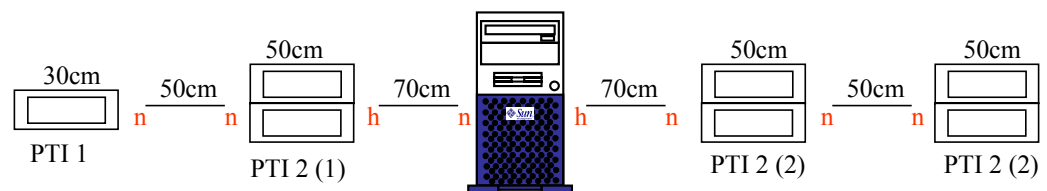
##### Configuration 1 + CD-Rec



##### Configuration 2 + CD-Rec



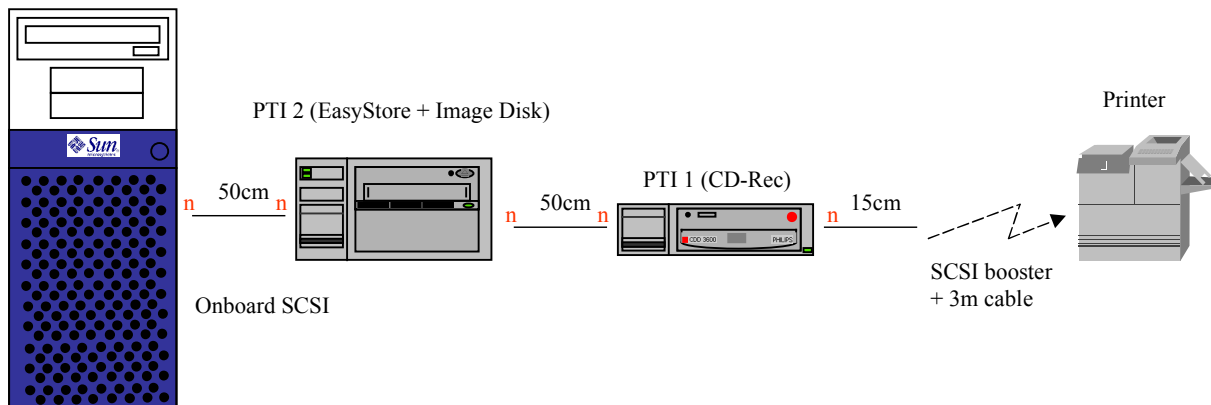
##### Configuration 3 + CD-Rec



## 7.2. ULTRASPARC 60 PTI 2 + PTI 1 CONFIGURATION (DESKTOP)

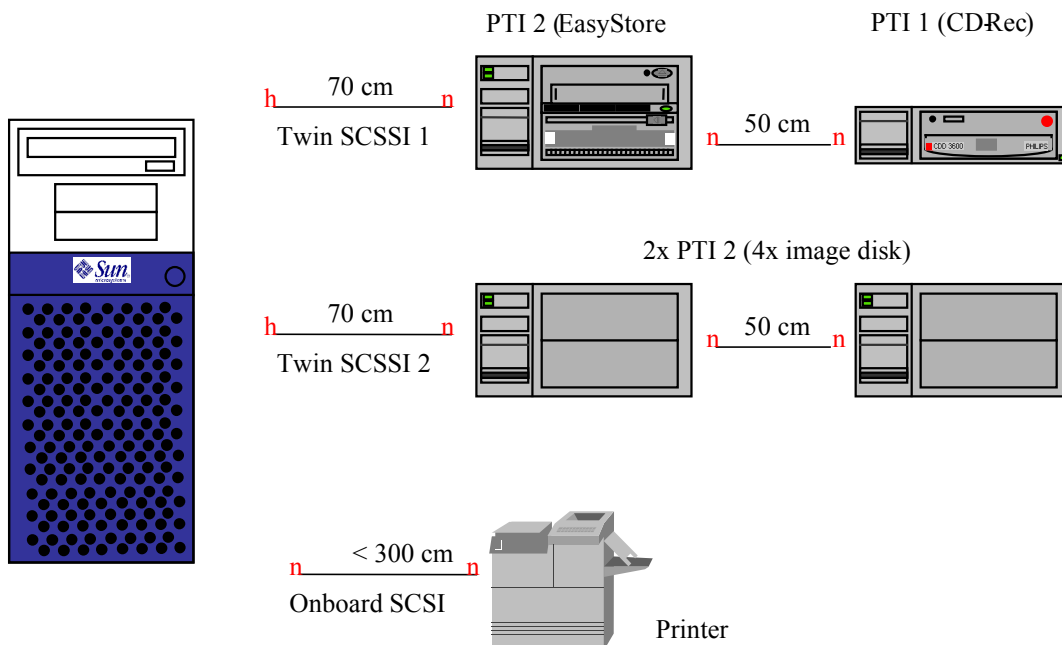
### 7.2.1. ONBOARD SCSI ONLY

In case of 3 devices (or less), only the onboard SCSI card is available. The next figure shows the configuration.



### 7.2.2. ONBOARD SCSI AND TWIN SCSI CARD

In case of more than 3 device, a Twin SCSI card is needed. The next figure shows the configuration.



#### NOTE

*If you have already 3 devices and you order an option, you will need the Twin SCSI card.*

## 8. CONNECTING A PRINTER

### **NOTE**

*See Z drawings for connection possibilities*

---

### 8.1. LASER PRINTER

In the **Imager Compatibility Service Manual** you will find a compatibility list of the Hardcopy Units supported by the EasyVision.

Non-Philips Laser Hardcopy Units are to be installed by the supplier.

In the Service Manual Imager Compatibility you will find the settings for the various Laser Hardcopy Units, when connected to EasyVision.

Usually the HCU service engineer will configure the HCU and will have the information necessary to do this. In some cases however he may not be aware of special settings when connecting to EasyVision.

### 8.2. SCSI PRINTER

### **WARNING**

*The maximum length of a SCSI chain, including the printer SCSI cable, is 3 meters !!!*

---

See Z drawings

To connect an SCSI Printer, remove the SCSI terminator from the peripheral enclosure.

Connect the printer SCSI-cable and SCSI adapter narrow/narrow between the SCSI connector of the peripheral enclosure and the printer itself or if relevant to a SCSI booster.

Put the SCSI terminator on the second SCSI connector of the printer or in case of a SCSI booster the termination is done by the SCSI extender (so no external terminator required).

For detailed installation information of SCSI printers please refer to the installation manual delivered with the printer.

### 8.3. NETWORK PRINTER

The network printer is connected to the network.

### 8.4. PARALLEL PRINTER

A Postscript printer can be connected to the parallel port (max. length - 3m)

## 9. ADDING PERIPHERALS TO PERIPHERAL ENCLOSURE

When adding a peripheral (SCSI device) to the peripheral enclosure:

- Switch off the power and disconnect the power cable and the SCSI cable.
- Open the top cover of the peripheral enclosure by removing screws.
- Remove plastic front cover in case of inter-active peripherals, e.g. Optical Disk, by removing screws on the inside.
- For inter-active peripherals like Optical disks you have to push out a metal part from the front of the enclosure. When adding an extra image disk this is not necessary!
- Check jumper settings!, see section Programmings
- Mount the SCSI device in the metal bracket inside the peripheral enclosure.
- Connect power and SCSI cable to new SCSI device.
- Replace the top cover and connect the cables again.

See Section Replacements for Additional Image disk.

## 10. CONNECTIVITY

### 10.1. PRINTERS

See Service Manual Imager Compatibility EasyVision Release 4.

### 10.2. PERSONAL COMPUTERS

Personal computers (Windows '95/'97, Windows NT) are able to view the image database by means of the Netview option (Software License needed).

Connect the PC with a network card to the network (must be the same network as the EasyVision), set IP address and make a **direct** connection.

On the **URL** bar type: server network address, semi-colon, port number 5000 (e.g. 192.168.130.1: 5000)

The next step is to login with a User Name and a Password (configured in the customize panel of the EasyVision)

#### 10.2.1. JPEG, TIFF

Images (JPEG, TIFF) and movies (MPEG) can be saved within the EasyVision application. These files can be put on CD-ROM for viewing on a Personal Computer. You need a PC application (Web browser) to view those JPEG, TIFF images or to watch an MPEG movie.

### 10.3. DICOM

The EasyVision DICOM configuration is described in the Release Bulletin.

There is also a Service Manual available "How to read a DICOM Conformance Statement", which is delivered with the EasyVision Release 4.x system.

---

**Section 3**
**Setting to Work**


---

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## 1. INTRODUCTION

The Operating System (OS), Application Software (AS), and license file are factory installed. For Software installation see Release Bulletin, if required.

## 2. POWER ON

### Desktop:

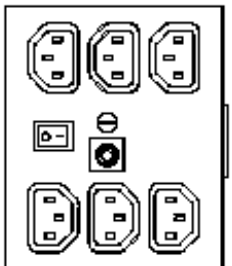


Figure 1 - Internal Furniture: power distribution box



Figure 2 - Internal Furniture: power distribution box

### Desktop Version:

Switch on the complete system by pressing the switch on the mains distribution box. The light on the mains switch box is always on when power is applied to it. If the light is off probably the fuse is burnt out.

If the computer does not start, check if the mains switch on the SUN SPARCstation is in the ON position.

### Furniture Version:

Switch on the complete system by pressing the power switch on the cabinet.

Now apply power to the system.

- Switch on the SUN SPARCstation
- Switch on the Peripheral Enclosure.
- Switch on the Monitor.

## 2.1. POWER ON SELF TEST AND OPENBOOT PROM PHASES

### **NOTE**

After powering on the system (black screen), it takes between 10 and 30 before the memory is tested.

---

After power on the factory-defined Power On Self Test (POST) phase and the OpenBoot PROM phase are performed automatically (see chapter "Sun Troubleshooting Overview", paragraphs "Factory Defined Boot Mode" and "After Power Is Switched On").

#### **POST phase:**

During the POST phase the blinking Caps Lock LED on the keyboard will tell you the POST is in progress. At successful completion of the POST phase the OpenBoot PROM firmware takes control.

#### **OpenBoot PROM phase**

During the OpenBoot PROM phase (high level POST) you will first see the EasyVision logo (an Eye) and then "Testing Memory" on the screen. If the OpenBoot PROM phase passes error free the system will boot automatically. If an error occurs, a message on the screen will appear telling you which unit failed.

Now the system should boot, as the SunOS and Application Software has already been loaded at the factory.

## 2.2. START-UP MENU

After boot up the system will display the Start- up Menu (see below). If no selection (number + CR) is made within 10sec, automatically the Application will be started!

1. Start Application
2. Start Customizing
3. Go to Service Menu
4. Go to Installation/Configuration Menu
0. Shutdown

Press selection 4, see Release Bulletin

## 3. CONFIGURATION / CUSTOMIZATION

- Concerning the configuration refer to the Release Bulletin EasyVision RAD Release 4.2.V2 configuration
- Concerning the Customization refer to the EasyVision RAD Operators manual.

## **4. POWER OFF**

### **4.1. POWER-OFF IN APPLICATION MODE**

#### **NOTE**

*Client/Server environment: If you turn the Easyserver off, the database is no longer accessible for the clients.*

---

Before switching off the power to the system, exit the clinical application as follows:

1. Click the left mouse button on the upper-left icon on the screen (packet switch icon).
2. Click the left mouse button on the upper-left icon on the 'packet switch' pop-up (logout icon).
3. Release the mouse button.
4. Answer the question: Do you really want to exit the application? by clicking with the left mouse button on confirm
5. The system will then return to the start-up menu. Select 0 (Shutdown) and the system automatically shuts down. After it has completed the shutdown, indicated by showing the ok prompt, you can switch the power off.

### **4.2. POWER-OFF IN SERVICE MODE**

Before switching off the power to the system, always exit from the service mode via the 'Logout' entry in the service menu so that the system can return to the start-up menu. Then select the 'Shutdown' entry and the system will then automatically shut down. After it has completed the shutdown, indicated by showing the ok prompt, you can switch the power off.

### 4.3. WHEN THE SYSTEM DOES NOT RESPOND NORMALLY

To halt a system that is hung, or frozen, and unresponsive to commands:

1	Press Stop-A.
---	---------------

#### **NOTE**

*If the system does not respond to the mouse and keyboard, pressing Stop-A will not be effective. You may have to switch the power off, wait at least 10 seconds, and switch the power back on again. Then try pressing Stop-A once more.*

---

2	When the ok prompt appears, boot the operating system. Enter boot at the ok prompt.
---	--

3	The 'Start-Up' menu will be displayed. Enter the number of your choice (See "Start-Up Menu").
---	---

## 5. MONITOR ADJUSTMENT

The brightness and contrast settings are not factory set. The settings must be adjusted. The adjustment procedure pre-condition is that the monitor is switched on for at least 30 minutes (no screensave operation) before you make any changes:

### NOTE

*When you configured EasyVision you should have selected "Normal" for the Monitor correction. (see Release Bulletin chapter: EasyVision Configuration). The other selections (Dark and Bright) are only necessary if this procedure does not give the correct results.*

---

- Start the Application software by:
  - switching on the system (automatic start-up) **or**
  - selecting "Start Application" in the Start-up Menu.
- When the application is started cancel "Pictorial Select" window.
- Click "Package Switch" and select "Database Handling".  
In "Database Handling" click "Tools" icon (at right hand top). The pop-up menu "Service functions" appears, select "Test Images". The pop-up menu "Test Images" appears, select "Load" Printer test images. The Test Images are loaded from a protected area into the local database.  
This way after deletion of the Test images from the local database the Test images can always be reloaded.
- Click "Package Switch" and select "Stack View". The "Pictorial Select" window is shown, select "Test image Printer Calibration" and double click it. Viewing is started, displaying the selected image.
- Select the one-on-one display format.
- Turn the contrast of the monitor to MAX.  
Adjust the brightness so that the 100% white area has a measured output according to the monitor unit manual (see Monitor unit manual Chapter 3: Setting to work).

Should two monitors be placed next to each other this adjustment may be required. Pay particular attention to the fact that brightness perception may differ, depending on your position with respect to the monitor. You must sit in the central position to verify if you have equal brightness. If you sit in front of the right monitor the left appears to be less bright, and when you sit in front of the left monitor the right appears to be less bright.

Follow the procedure described above to adjust both monitors equally.

## 6. HARD COPY UNIT (HCU) CALIBRATION

### 6.1. INTRODUCTION

What is the HCU calibration used for ?

The HCU calibration is necessary to establish a correction (curve) between the EasyVision RAD and a printer (HCU). This correction adapts the EasyVision printing characteristics to individual deviations of the printer characteristics such as laser power adjustment, film characteristics, developer chemistry or temperature etc.

The HCU calibration will be done in two major steps:

1. The density calibration (Gamma Correction) with two substeps:
  - the HCU calibration
  - the verification of the HCU calibration
2. The pixel size calibration

**Important:** Both the density calibration and pixel calibration have to be carried out for any media of all printers connected.

#### 6.1.1. PRECONDITIONS

After the complete software has been installed on the EasyVision and the system has been configured and customized, the correct density calibration (gamma correction curve) and the pixel size calibration must be carried out on the EasyVision.

Before you do so make sure that the following steps have been carried out:

- The hard copy unit is setup properly with respect to its configuration (this has to be done by the printer manufacturers service engineer)
- The printers self-calibration has been checked or corrected (manufacturers service engineer or Hospital personnel)
- The densitometer has been calibrated and is operating correctly (Philips service personnel)

## 6.2. HCU DENSITY CALIBRATION (GAMMA CORRECTION)

### 6.2.1. DELETING AND LOADING OF THE TESTIMAGES

In order to only use the Testimage PrinterCalibration in its original unmodified condition all testimages must be deleted and then loaded again.



If the application is not running

Start the application :

- from the ok prompt with the command: ok **boot** <Enter>  
(the EasyVision will automatically start the application)
- from the Start up Menu select: **1 Start Application**

If the application is running:

Switch from the **PCR** application screen to the **Data handling facility**;

- click on the door handle icon  and on the data handling icon 
- Highlight all Testimage objects in the patient list
- 

#### 6.2.1.1. Deleting the Testimages

If the **Testimage....** objects are not visible scroll the patient list with the scrollbar up or down until the **Testimages** appear (default 23 objects);

if the **Testimages** are not listed at all continue with 6.2.1.2 Loading the Testimages.

- Highlight all listed Testimage... entries:  
→ position the cursor on the uppermost **Testimage...** and drag the cursor with the left mouse button pressed down to the last **Testimage...** object; (Refer to Figure 3)
- Click on the button **Delete** and **confirm**; the Testimage objects will disappear from the patient list

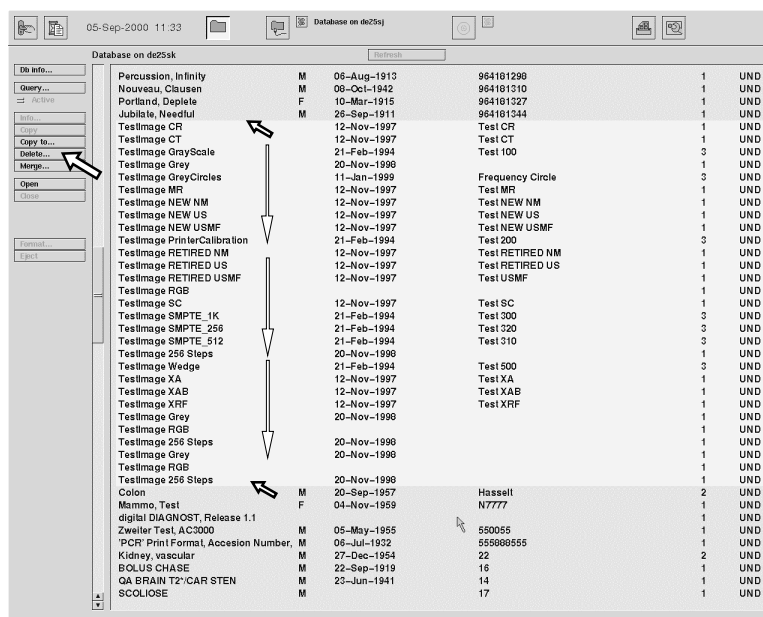

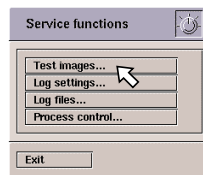


Figure 3: Datahandling Screen

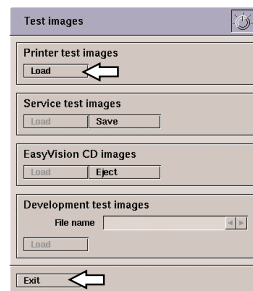


### 6.2.1.2.Loading the Testimages:

- Click on the tool icon on the tool bar on the top right of the screen. 
- In the small panel **Service Functions** popping up click on **Testimages**



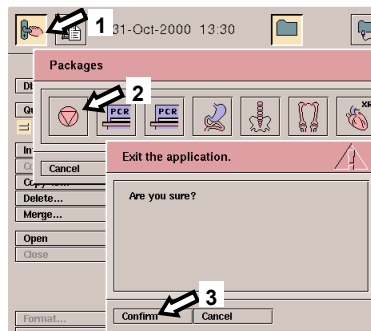
- In the panel Testimages click on the button **Load** in the area **Printer test images**; the testimages will be loaded on the image database. It will take some seconds for the 23 Testimages to sequentially appear on the image list. Click on **Exit**.



### 6.2.2. THE DENSITY CALIBRATION (GAMMA CORRECTION) PROCEDURE

Exit the application until the **Startup menu** will be displayed.

- Click on the door handle ① on the Exit icon ② and confirm ③ in sequence



The EasyVision RAD Startup Menu will be displayed:

#### EASYVISION STARTUP MENU

What do you want to do?:

- 1 Start Application
- 2 Start Customization
- 3 **Go to Service Menu**
- 4 Go to Installation/Configuration Menu
- 0 Shutdown

- Select **3 Service Menu** from the Start-up Menu and enter the password  
The Service Menu will be displayed:

#### Service Menu

1. Diagnostics Menu (sunvts and product diagnostics)
  2. Sun Os Menu (optical disk format and Sun Os commands)
  3. File Menu (file transfer and manipulation commands)
  - 4. **Printer Menu (printer tests)**
  5. Monitor Menu (Monitor test images and adjustment)
  6. PCR Systems (PCR diagnostics menu)
- 0 Logout

Enter the number of your choice:

- Select **4 Printer Menu** the printer menu will be displayed

#### Printer Menu

- 1 **HCU Calibration (start hardcopy unit calibration)**
  - 2 Start Printer Status Request
  - 3 Start Data Channel Printer Test  
Data is sent to the HCU via the data channel, then  
press print on the HCU control panel for output
  - 4 Start Printer Test
  - 5 Start S-bus/PCI Printer Visual Interface Test (Led board required)
  - 0 Return to Service Menu
- Select **1 HCU Calibration**.  
The Hard Copy Unit start screen with the icon bar will be displayed. Gamma correction calibration and pixel size calibration will be performed in sequence.

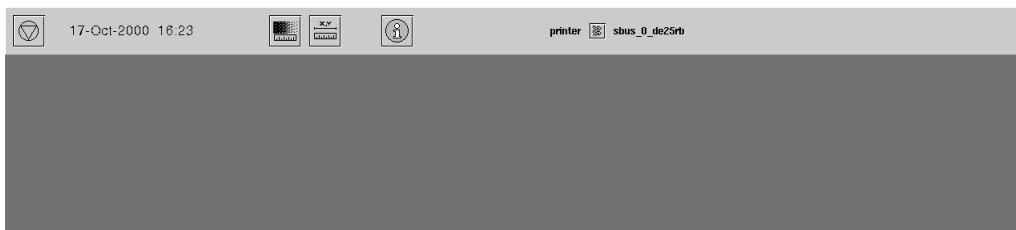

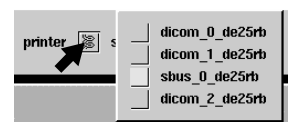


Figure 4: HCU Calibration start screen

### 6.2.3. HARD COPY GAMMA CORRECTION

The HCU Gamma correction and pixel correction must be carried out for all configured printers and film sizes (Media)

- Click with the right mouse button on the **printer** select spiral icon  on the icon bar and select the printer you want to calibrate.



**Note:** The printer identification strings such as **dicom\_0\_de25rb** in the example above tells you that this is the **DICOM printer No. 0** (the first) connected to the EasyVision RAD with the IP node name **de25rb**. The relation about which identification string belongs to which physical printer must be taken from the file **/easydata/configuredPrinters.dat** at the EasyVision RAD with the node name **de\_25rb** (in this example).

- Click on the Hard Copy Gamma Correction icon on the icon bar. The Hard Copy Gamma Correction screen will be displayed. (refer to Figure 5: Hard Copy Gamma Correction screen)

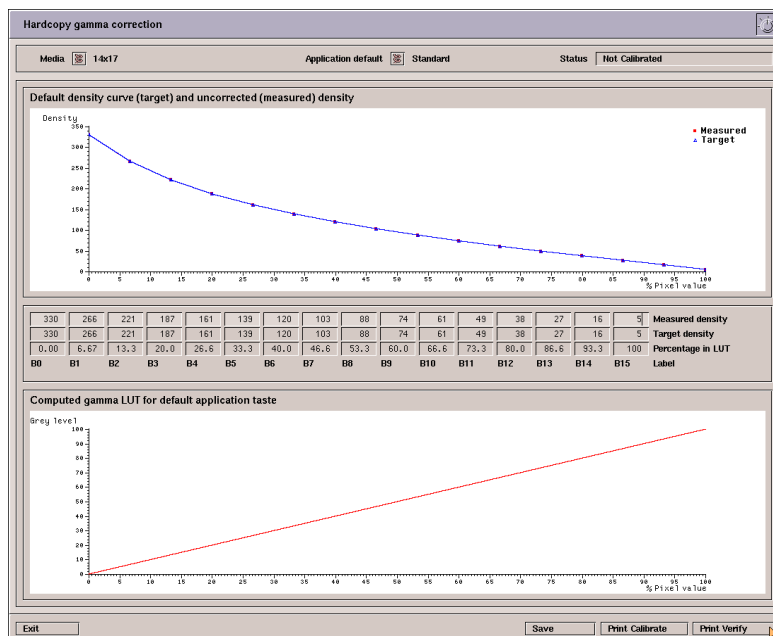


Figure 5: Hard Copy Gamma Correction screen

- Click with the right mouse button on the spiral icon **Media** on the top left of the screen and select the media in the Hard Copy Unit you want to calibrate now.
- Click on the button **Print Calibrate**. The Print Preview panel appears and displays a 2 by 2 array of the PrinterCalibration image in the Print Calibration panel.

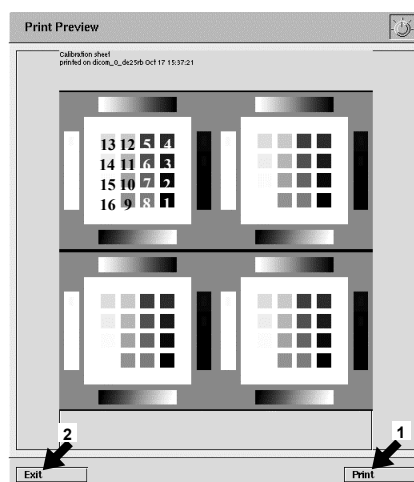
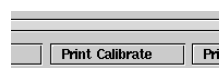
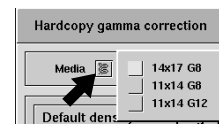
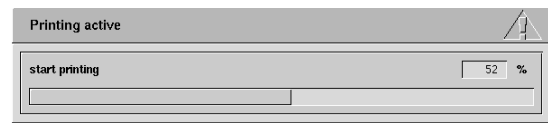


Figure 6: The Calibration Print Preview panel

- Click on **Print** ① on the Print Preview panel. The Printing Active panel will be displayed. Wait until the Printing Active panel disappears to indicate that printing is complete.



- Click on the button **Exit** ② of the Print Preview panel to terminate the Print Preview panel. The panel disappears; (don't care if the print Preview panel vanishes without the command **Exit** )

When the 'Test Print' is ready:

**(for standard accuracy)**

- Measure the density values of the 16 grey squares of the upper left array on the film. Start with the darkest grey level: No.1; (*Calibrate the densitometer first!*), (for numbering refer to Figure 6: The Calibration Print Preview panel upper left array)  
→ *The maximum density must be between 2.9 and 3.1 optical density..*
- Fill in all measured density numbers in the **EasyVision RAD / Imager Calibration form** at the end of this chapter. Fill in the density numbers of the 16 grey levels (start with the darkest grey level: 1,) in the column **average** of the table **EasyVision RAD Calibration**.
- Now enter the same 16 values in the row '**Measured density**' in the Hard Copy Gamma Correction screen using the TAB key to always select the nearest field on the right.  
→ continue with How to proceed

**(for higher accuracy)**

- Measure the density of the 16 grey squares in all 4 arrays. Start with the darkest grey level: No.1 (*Calibrate the densitometer first!*)  
→ It is **important** to measure **all** 4 arrays (4 times 16 density values = 64 density values). This is necessary because of the tolerances between the darkest and the lightest areas on the film.  
*The maximum density must be between 2.9 and 3.1 optical density;*
- Fill in all measured density numbers in the **EasyVision RAD / Imager Calibration Form** at the end of this chapter. Start with the table **EasyVision RAD calibration** and fill in the 16 density numbers of an array of 16 squares in one column e.g. upper left upper right etc. (Don't use the original form make copies of it for spare).  
→ The result will be all 4 density numbers of all matching grey levels in one row.
- Take the 4 readings belonging to one grey level (1 row) calculate the average and enter the result in the column **average** of that grey level. Repeat this for all 16 grey levels.
- Enter the 16 averages in the row '**Measured density**' in the **Hard Copy Gamma Correction** screen on the EasyVision; use the TAB key to always select the nearest field on the right

→ You may correct wrong entries as follows:

- Put the cursor just behind the wrong entry.
- Press left mouse button ( an "I" appears).
- Delete entry using DEL key on keyboard.
- Enter new value.

### How to proceed

- Check whether for **Application default** → **Standard** has been selected.  
**Note** : on the EasyVision RAD **Standard** is mandatory.
- Click on **Save**. The Calibration **Save** panel will be displayed.

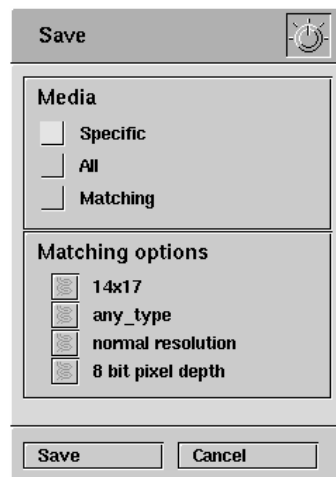



Figure 7: Calibration Save Panel

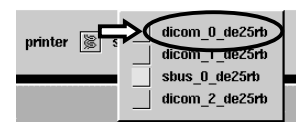
- Select from the box **Media** in the **Save** panel:
  - Specific**; only that media type will be calibrated which is displayed under **Media** at the top left of the Hard Copy Gamma Correction panel;
  - **Note**: it is strongly recommended to always select **Specific**
  - All** in which the calibration is valid for all media types for the printer selected
  - Matching** in which the calibration is valid for all media of the same size of the printer selected
- Click on **Save** in the save panel.
- Click on **Exit** to terminate the Hard Copy Gamma Correction.

### 6.2.4. VERIFICATION OF THE DENSITY CALIBRATION

Checking the results of the Hard Copy calibration proceed follows:

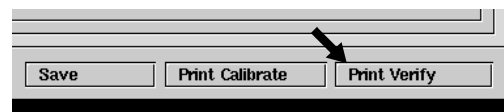
→ Make sure that the same printer has been selected as in the calibration procedure.

- Click with the right mouse button on the **printer** select spiral icon  on the icon bar and select the printer you want to check.



Note: The printer identification strings such as **dicom\_0\_de25rb** in the example above tells you: this is the **DICOM printer No. 0** (the first) connected to the EasyVision RAD with the IP node name **de25rb**. The relation about which identification string belongs to which physical printer must be taken from the file `/easydata/configuredPrinters.dat` at the EasyVision RAD.

- Click on **Print Verify**. The Print Verify will print the Printer calibration film in a 2 by 2 array now in that way as a film will be printed by the application.



- Click on **Print** in the Print Preview panel. The printing active panel will be displayed and the verification film will be printed.

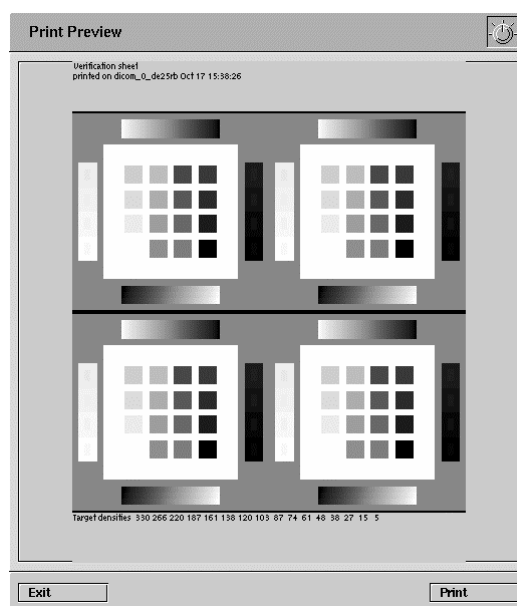


Figure 8: Verification Print Preview Screen

Click on the button Exit to dismiss the Verification Print Preview Screen.

Perform the measurement on the verification film as described in chapter 6.2.3. (first recheck the calibration of the densitometer!). Enter the numbers in the **EasyVision RAD calibration form** table:  
**EasyVision RAD Calibration Verification;**

- Enter the measured density values in the column average of the **EasyVision RAD Calibration Verification form**
- Transfer the density numbers of the row Target density from the Hard Copy Gamma Correction screen to the column **Target density** of the **EasyVision RAD Calibration Verification form**.

309	265	226	193	169	148	132	116	102	88	75	64	53	44	32	20	Measured density
309	256	217	187	164	144	127	111	97	84	71	60	49	40	30	20	Target density
0.00	6.67	13.3	20.0	26.6	33.3	40.0	46.6	53.3	60.0	66.6	73.3	80.0	86.6	93.3	100	Percentage in LUT
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	Label

Example

**Note:** At this point the density calibration procedure ends.

Do not try to enter again the readings of the verification film in the Gamma correction tool  
**This will end up in a situation of miscalibration**

### 6.2.5. CALCULATING THE DIVERGENCES

For any grey level the measured density ( $D_M$ ) value should be **within 5%** of the Target density ( $D_T$ ) plus an offset of 0.02:

$$D_{M\text{ var}} = \text{Measured density} \pm (5\% D_T + 0.02).$$

Example:

The Measured density  $D_M$  is 226 (= 2.26 optical density).

The Target density  $D_T$  is 217 (= 2.17 optical density)

The range of tolerance for  $D_M$ :  $= 2.17 \pm (5\% D_T + 0.02)$

$$5\% \text{ of } 2.17 = 0.05 \times 2.17 = 0.1085$$

$$= 2.17 \pm (0.1085 + 0.02)$$

$$= 2.17 \pm 0.1285$$

The maximum value of  $D_M$   $= 2.17 + 0.1285 = 2.2985 \approx \mathbf{2.30}$

The minimum value of  $D_M$   $= 2.17 - 0.1285 = 2.0415 \approx \mathbf{2.04}$

Result: the measured density belonging to the target density 2.17 may vary from **2.04** to **2.30**

→The measured density of 2.26 is within the limits of this grey level.

If any of the density values is not within the limits perform one or more of the following steps:

- Have the printers own calibration rechecked (hospital personnel)
- Verify that your densitometer is operating correctly (densitometer calibration!)
- Check again the current calibration; check the current values for incorrect entries and/or incorrect calculations

### 6.3. PIXEL SIZE CALIBRATION

- Make sure that the same printer has been selected as in density calibration.

- Click on the Hard Copy Pixel Size icon.



The **Hard Copy pixel size calibration** panel will be displayed. (Figure 8)

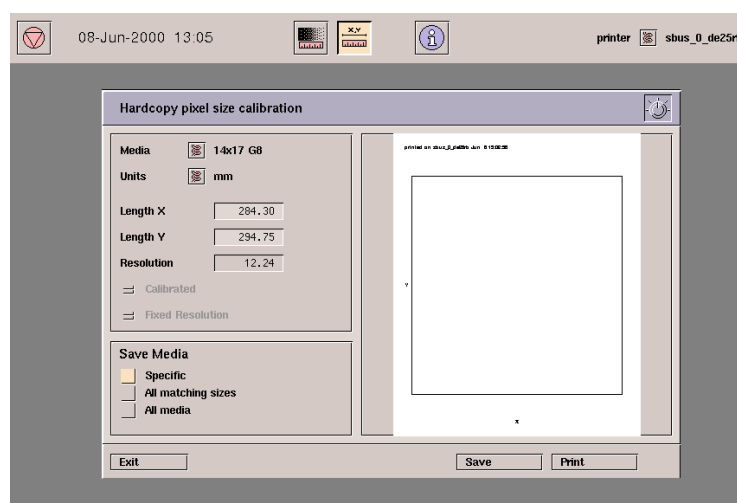
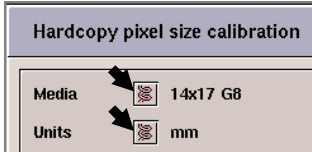


Figure 9: Pixel Size Calibration panel

- Click with the left mouse button on **Media** in the Hardcopy pixel size calibration panel until your selected media size appears.
  - Click with the right mouse button on the Units selection spiral until your preferred unit of length will be displayed.
- 
- The image shows a 'Hardcopy pixel size calibration' window. It has two sections: 'Media' and 'Units'. The 'Media' section shows a spiral selection with '14x17 G8' selected. The 'Units' section shows a spiral selection with 'mm' selected.
- Click on **Print** in the Hardcopy Pixel Size calibration panel. The printing active information box appears and indicates the progress of the print process. When the calibration film has been printed the information box disappears.
  - Measure the distances of Length X and Length Y on the film as accurately as possible with a ruler. If X and Y are mismatched, enter the lengths individually in their respective fields. The field resolution displays the number of pixels per unit of length selected.
  - Select either **Specific** or **All Matching Sizes** in the Save Media dialog box:  
**Specific** in which only the selected media will be calibrated; (recommended)  
**All Matching Sizes** in which all media of the same size on the selected printer will be calibrated.

### NOTE

*The selection Specific may be repeated for other supported media.*

- Click on Save in the Hardcopy pixel size calibration panel.
- Click on Exit to terminate the Hard Copy Pixel Size calibration.
- Click on the icon **Exit** to terminate the Hard Copy calibration.

## 6.4. CHECKING THE RESULTS

- Select the printer you want to check
- click on the information icon on the top icon bar to check the results and the status of the calibration



The Printer information status panel will be displayed:

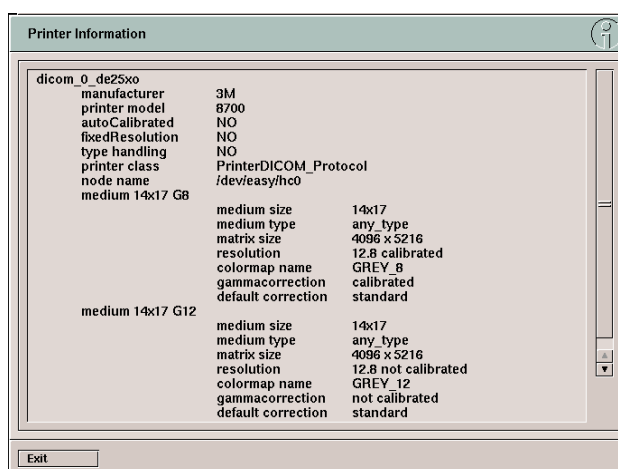


Figure 10: Printer information panel

This panel supplies information about which media are calibrated (both density and pixel) on the selected printer plus additional information. (refer to Figure 10)



## 7. BACKUP & RESTORE

### 7.1. VIA SERIAL PORT

**Tools needed:** Service PC + null modem cable.  
Communication software (e.g. Kermit).

You need your Service PC to make a back-up of the **EasyVision Release Configuration file** and to duplicate this configuration file on each EasyVision .  
The PC can be used the same way to make a back-up of the 'Customize' and 'HardCopy Calibration' files.

With every EasyVision RAD the '**Kermit**' communication software will be delivered on a 3.5" (720KB) floppy. The procedure on how to up and download files using 'Kermit' is described in the Release Bulletin (Appendix A). Feel free to use your own communication package (e.g. ProcommPlus) for up and downloading files. As well as 'Kermit', EasyVision also supports X-Modem, Y-Modem and Z-Modem communication protocols.

### 7.2. VIA FLOPPY DRIVE

It is possible to use the UltraSparcs (Ultra5/10) floppy drive to backup/restore the necessary files. Refer to Section Faultfinding, chapter "File Transfer", or refer to the Release Bulletin.

## 8. EASYVISION RAD / HCU CALIBRATION FORM

EasyVision Calibration Form											
Printer Model :								Format:			
EasyVision Calibration											
	Upper Left	Upper Right	Lower Left	Lower Right	Average	Target Density	Deviation in o. D.	Dev. in [%]	Lower error limit	Upper error limit	Calibration necessary
1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											
9.											
10.											
11.											
12.											
13.											
14.											
15.											
16.											

Calibration Verification											
	Upper Left	Upper Right	Lower Left	Lower Right	Average	Target Density	Deviation in o. D.	Dev. in [%]	Lower error limit	Upper error limit	Calibration successfull
1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											
9.											
10.											
11.											
12.											
13.											
14.											
15.											
16.											
	<b>Date:</b>				<b>System:</b>						
	<b>Time:</b>				<b>Operator:</b>						

---

## Section 4

## Faultfinding

---

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## 1. INTRODUCTION

With the launch of EasyVision Release 4 a client/server concept is released. This means that, besides the “old” standalone EasyVisions, a small cluster network is introduced with one server and one or more clients. The next chapters describe a top-down method to troubleshoot such a configuration.

In case of a standalone you can start with chapter 4 Sun SPARC computers.

Overview of Faultfinding tools:

- |                             |  |
|-----------------------------|--|
| • Power On Self Test (POST) | See SPARCstation Unit manual                   |
| • Service Menu tests        | See chapter 5 Service Menu                     |
| – Diagnostics               |  |
| – UNIX                      |  |
| • Forth Toolkit             | See SPARCstation Unit manual                   |
| • Logfiles                  | See chapter 8 EasyVision log files             |
| • SUN VTS                   | See Answerbook on distribution CD              |
|                             | (Open windows Canvas, pop-up menu, Answerbook) |

### WARNING

*In case of SCSI errors (UltraSPARC), check cabling/connectors inside the Peripheral Cabinet.  
Be careful with the EMC protective sticky fingers.*

---

### WARNING

*In case of a black screen, check keyboard cabling.*

---

### WARNING

*If the Application doesn't start-up after a successful configuration, check License Manager Lmgrd.startup file.  
(See paragraph 8.5 License logfile Lmgrd.startup)*

---



## 2. CLIENT/SERVER ENVIRONMENT

Flow Chart:

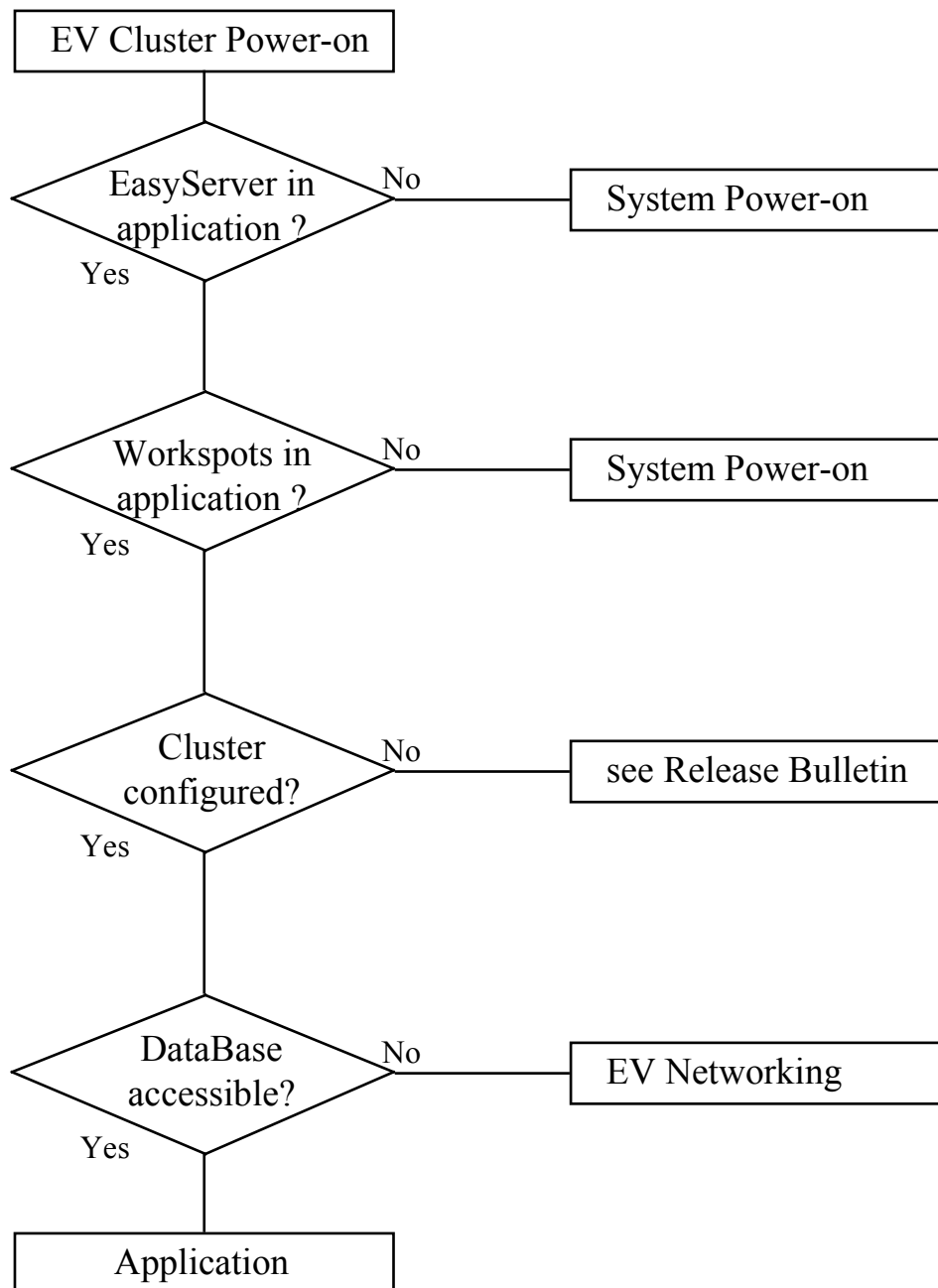


Figure 1: Cluster Level FlowChart

### 3. EASYVISION RAD R4.2V2 CLUSTER NETWORK

A typical EasyVision RAD Release 4 / PCR-Network looks like the picture below. There are two networks: The EasyVision cluster network (fast ethernet) and the modality network (standard ethernet).

Another remark at this picture is that because the EasyServer is connected to two networks, it also has two ip-addresses (static router functionality), one for each network device (ethernet controller).

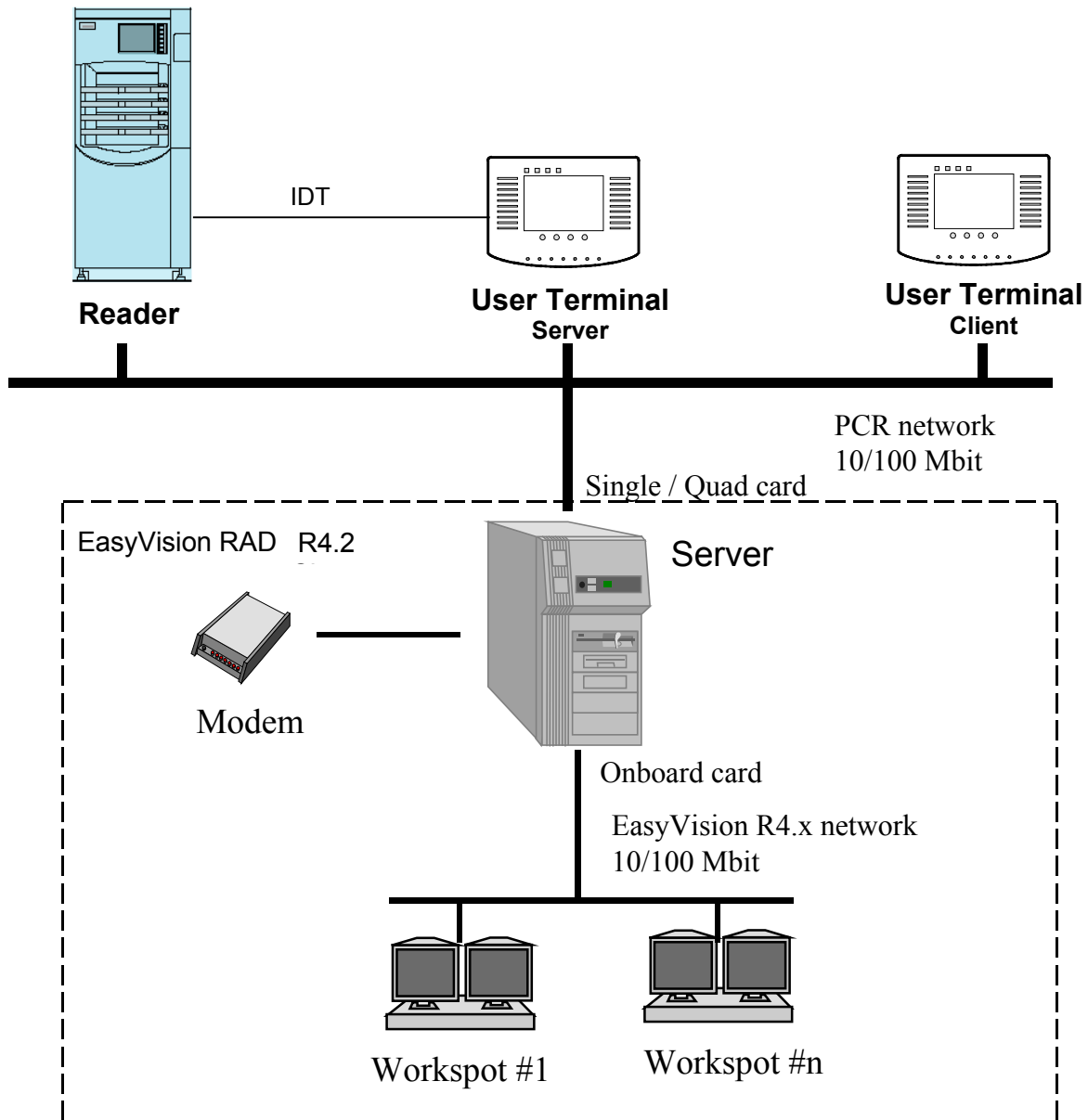


Figure 2: PCR Cluster

In case of problems:

- Use **ping** command, see Service Manual Networking
- Check cables
- Check IP-addresses
- Check Fast Ethernet HUB (led indicator)
- Check Ethernet Controllers

See Network Manual for detailed information.

## 4. SUN SPARC COMPUTERS

For EasyVision RAD Release 4.2V2 the following SUN SPARC computers are used:

- |            |                |                          |
|------------|----------------|--------------------------|
| • Ultra 5  | 333 MHz/360MHz | see Unit Manual Ultra 5  |
| • Ultra 10 | 333 MHz/440MHz | see Unit Manual Ultra 10 |
| • Ultra 60 | 360MHz/450MHz  | see Unit Manual Ultra 60 |

Flow Chart:

### System Power-on Faultfinding

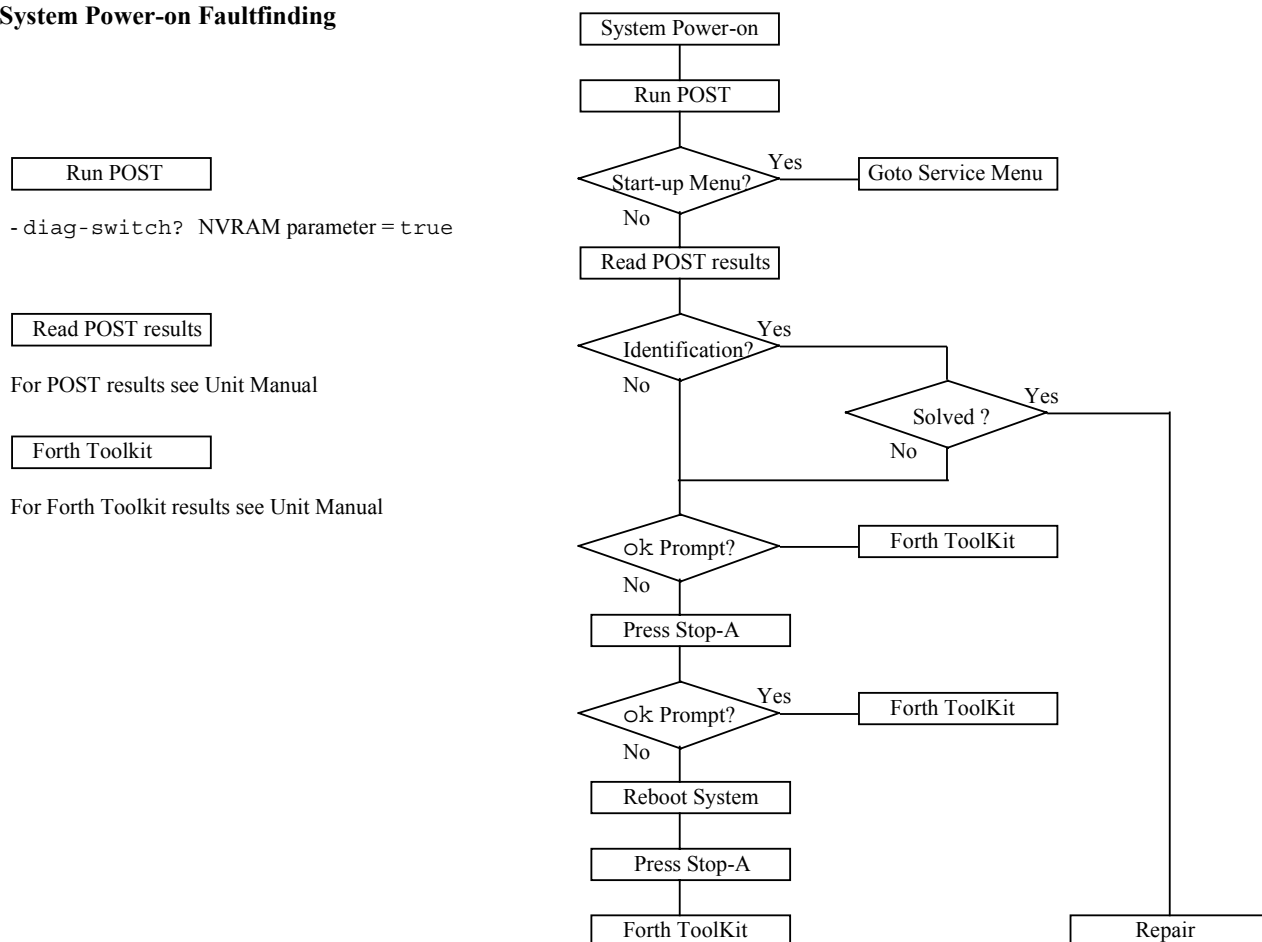


Figure 3: System Power on Faultfinding

## 4.1. NON-VOLATILE RAM (NVRAM) PARAMETERS

### 4.1.1. NON-VOLATILE RAM (NVRAM) PARAMETERS ULTRA 5-10

Parameter name	Value	Default Value
tpe-link-test?	true	true
scsi-initiator-id	7	7
keyboard-click?	false	false
keymap		
ttyb-rts-dtr-off	false	false
ttyb-ignore-cd	true	true
ttya-rts-dtr-off	false	false
ttya-ignore-cd	true	true
ttyb-mode	9600,8,n,1,-	9600,8,n,1,-
ttya-mode	9600,8,n,1,-	9600,8,n,1,-
pcia-probe-list	1,2	1,2
pcib-probe-list	1,3,2,4,5	1,3,2,4,5
mfg-mode	off	off
diag-level	max	min
#power-cycles	74	
system-board-serial #	5014450026841 <i>(example)</i>	
system-board-date	35bd5758 <i>(example)</i>	
fcode-debug?	false	false
output-device	screen	screen
input-device	keyboard	keyboard
load-base	16384	16384
boot-command	boot	boot
auto-boot?	true	true
watchdog-reboot?	false	false
diag-file		
diag-device	net	net
boot-file		
boot-device	disk	disk net
local-mac-address?	false	false
ansi-terminal	true	true
screen-#columns	80	80
screen-#rows	34	34
silent-mode?	false	false
use-nvramrc?	false	false
nvramrc	devalias pgx24 /pci@1f,0..	
security-mode	none	none
security-password		
security-#badlogins	0	
oem-logo	00 00 00 00 00 00 00 00 ...	
oem-logo?	true	false
oem-banner		
oem-banner?	false	false
hardware-revision		
last-hardware-update		
diag-switch?	false	false

#### 4.1.2. NON-VOLATILE RAM (NVRAM) PARAMETERS ULTRA 60

Parameter name	Value	Default Value
scsi-initiator-id	7	7
keyboard-click?	false	false
keymap		
ttyb-rts-dtr-off	false	false
ttyb-ignore-cd	true	true
ttya-rts-dtr-off	false	false
ttya-ignore-cd	true	true
ttyb-mode	9600,8,n,1,-	9600,8,n,1,-
ttya-mode	9600,8,n,1,-	9600,8,n,1,-
pcia-probe-list	1,2	1,2
pcib-probe-list	1,3,2,4,5	1,2,2,4,5
mfg-mode	off	off
dial-level	max	min
#power-cycles	74	
system-board-serial #	5014450026841 (example)	
system-board-date	35bd5758 (example)	
fcode-debug?	false	false
output-device	screen:r1280x1024x76	screen
input-device	keyboard	keyboard
load-base	16384	16384
boot-command	boot	boot
auto-boot?	true	true
watchdog-reboot?	false	false
diag-file		
diag-device	net	net
boot-file	/kernel/unix	
boot-device	disk	disk net
local-mac-address?	false	false
ansi-terminal	true	true
screen-#columns	80	80
screen-#rows	34	34
silent-mode?	false	false
use-nvramrc?	false	false
nvramrc		
security-mode	none	none
security-password		
security-#badlogins	0	
oem-logo	00 00 00 00 00 00 00 00 ...	
oem-logo?	true	false
oem-banner		
oem-banner?	false	false
hardware-revision		
last-hardware-update		
diag-switch?	false	false

## 5. SERVICE MENU

### 5.1. SERVICE MENU VIA SUN CONSOLE

To access the service menu environment select entry number 3 (Go to Service Menu) in the StartUp menu.  
Then at the **password:** prompt enter **password**

#### Service Menu

- 1. Diagnostics Menu (sunvts and product diagnostics)
- 2. SunOs Menu (optical disk format and Sun Os commands)
- 3. File Menu (file transfer and manipulation commands)
- 4. Printer Menu (printer tests)
- 5. Monitor Menu (Monitor test images and adjustment)
- 6. PCR Systems (PCR diagnostics menu)

0 Logout

Enter the number of your choice: 1

### 5.1.1. DIAGNOSTICS MENU

#### Diagnostics Menu

1. Start SunVts (Sunvts hardware diagnostics)  
After using SunVTS, use 'Exit...' in the workspace pop-up menu to return to this menu
2. Start EasyStore DOR Test (sa0)
3. Start CT/MR input DOR Test (sa1)
4. Start Dials Test
5. Check Modem's SW Settings  
Type ~. to quit the check and return to this menu.
6. Initialize Modem
7. Set Speed of Serial port
8. Start PCI Reader Interface Test
0. Return to the service menu

Enter the number of your choice: 0

Select 8. Start PCI Reader Interface Test

The System will prompt:

Connect PCR Reader testbox. Press <Enter> to continue :

after the textbox has been connected and powered press **Enter**, The system will respond:

**PCR Reader Interface test takes about 5 seconds**

if the system didn't detect any fault condition it will return the message

**PCR Reader Interface test succeeded**

press <Enter> to continue

If the system detects any fault condition during this test run, i.e. if power is not applied to the test box or the test cable is not connected to the Sun computer the system will respond:

poll control line , timed out  
**PCR Reader Interface test failed**  
 Press <Enter> to continue :

#### **Caution**

The test program will finish the test with the following message even if the test box was not connected during the test.

**'Reader Interface Test' ended normal, status 0**  
**Control channel and Data channel are both ok up to test box**

Press <Enter> to continue:

after pressing <Enter> the system will output the **Diagnostics Menu**

There is no detailed error handling available which is capable to detect different levels of faulty conditions and which allows conclusions on errors.

### 5.1.2. SUNOS MENU

#### SunOs Menu

1. Optical Disk Format Menu.
2. SunOs: a C-shell is started in the service directory.  
Type 'exit' to return to this menu.
3. ADB Convert (synchronize Anatomy DataBase and Processing Keys)
3. SunOS: OpenWindows is started in the service-directory  
Use 'Exit...' in the workspace pop-up menu to return to this menu

0 Return to the service menu

Enter the number of your choice: 0



### 5.1.3. FILE MENU

#### File Menu

- 1 Logfiles Inspection (a C-shell is started in the log directory)  
Use 'ls -l', 'more', 'tail -31l' to examine the logfiles.  
Type 'exit' to return to this menu.
- 2 Images Inspection (a C-shell is started in the images directory)  
Use 'ls -l' to examine the image files.  
Type 'exit' to return to this menu.
- 3 Create file /tmp/logfiles.zip containing logfiles and config files.
- 0 Return to Service Menu

Enter the number of your choice:

### 5.1.4. PRINTER MENU

#### Printer Menu

- 1 HCU Calibration (start hardcopy unit calibration)
- 2 Start Printer Status Request
- 3 Start Data Channel Printer Test  
Data is sent to the HCU via the data channel, then press print on the HCU control panel for output
- 4 Start Printer Test
- 5 Start S-bus/PCI Printer Visual Interface Test (Led board required)
- 0 Return to Service Menu

Enter the number of your choice:

### 5.1.5. MONITOR MENU

#### Monitor Menu

- 1 Start Monitor Color Map Test
- 2 Show LCD testimage (POPO\_1288x1024.gif)
- 0 Return to Service Menu

Enter the number of your choice:

### 5.1.6. PCR SYSTEMS MENU

#### PCR Systems Menu

---

- 1 File Transfer- and Compression Settings Menu
- 2 File Transfer Menu (log and image file transfer)
- 3 ADB Convert (synchronize Anatomy Data Base and Processing Keys)
- 4 Set Serial Interface Parameters
- 5 PCR Reader Documentation

0 Return to Service Menu

Enter the number of your choice:

#### 5.1.6.1. File Transfer Settings Menu

##### File Transfer Settings Menu:

---

##### Actual Configuration:

EasyVision → RTAC: sz/rz

EasyVision ← RTAC: sz/rz

Compression: Zip

- 1 EasyVision → RTAC: Use kermit (works only with modem terminal connections)
- 2 EasyVision ← RTAC: Use kermit (works only with modem terminal connections)
- 3 EasyVision → RTAC: Use sz/rz (works only with modem terminal connections)
- 4 EasyVision ← RTAC: Use sz/rz (works only with modem terminal connections)
- 5 EasyVision ↔ RTAC: Use ftp (works only with TCP/IP and ftp-server running on RTAC host)
- 6 Zip (mostly used compression SW on DOS based computers)
- 7 UNIX compress (tar| mostly used compression SW on UNIX based computers)

0 Return to Service Menu

Enter the number of your choice:

### 5.1.6.2. File Transfer Menu

#### File Transfer Menu

---

Actual Configuration: RTAC → EasyVision : sz/rz  
EasyVision → RTAC sz/rz  
Compression: Zip

- 1 Collect & Send Logfiles
- 2 Send Image Files (Menu)
- 3 Manual File Transfer

(a C-shell is started: go to the directory where you want to send/receive files from/to. Then start the desired protocol by typing its name followed by the appropriate arguments:)

- 0 Return to Service Menu

Enter the number of your choice:

### 5.1.6.3. Serial Interface Menu

#### Serial Interface Menu:

---

Actual Configuration:

Device: ttyb  
Mode: Modem

- N Set Mode to Nullmodem (RTAC-cable-EV)
- M Set Mode to M odem (RTAC-modem-EV)

!!! NOTE !!!

Don't forget to (re)set this flag to Modem  
if Modem connection is desired later on!

!!! NOTE !!!

- 0 Return to Service Menu

Enter the number of your choice:

*next page cont'd*

#### 5.1.6.4. PCR Reader Documentation

##### 5 PCR Reader Documentation

###### PCR Reader Documentation

**Insert the CD-ROM containing the PCR Reader Documentation and press Return to continue:**

- OpenWindows and the Acrobat Reader will be started.
- On 'File' and 'Open' the 'Open' window of the Acrobat Reader will be displayed.

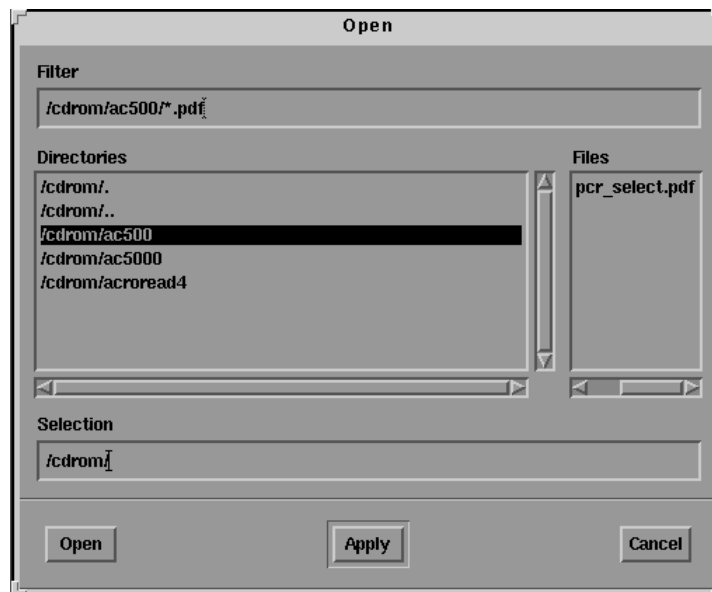


Figure 4: Acrobat Reader File Open Window

- Double click on the line /cdrom/ac500 or /cdrom/ac5000 to select the appropriate system.
- The documentation files available on this CD-ROM are listed in the 'Files' area on the right ( Figure 5)
- Double click on the line of the document you want to open and view.
- The first page of the document will be displayed

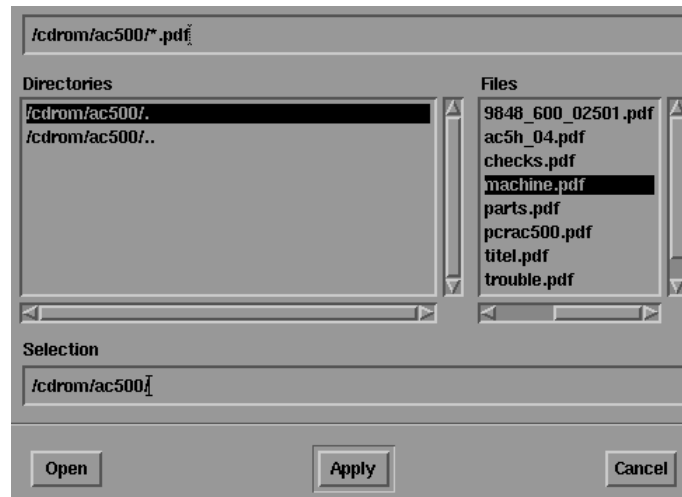


Figure 5: Acrobat Reader select File Window

## 5.2. SERVICE MENU VIA SERIAL PORT

login: Service

Password: <Enter HostID>

Last login: Tue Dec 2 14:13:51 on term/b

PMSN-ICS      Solaris 2.5.1 adapted for EasyVision      June 1996

```
+-----+
| WARNING   : Access for authorised persons only |
+-----+
```

Last local login: Tue Dec 2 11:26:37 MET 1997

### Service Menu

- ```
=====
```
- 1    Diagnostics Menu    (sunvts and product diagnostics)
  - 2    SunOS Menu        (optical disk format and SunOS commands)
  - 3    File Menu        (file transfer and manipulation commands)
  - 4    Printer Menu     (Printer tests)
  
  - 0    Logout

Enter the number of your choice:

### 5.2.1. DIAGNOSTICS MENU

## Diagnostics Menu

- 1 Start SunVts (Sun hardware diagnostics)
- 2 Start EasyStore DOR Test (sa0)
- 3 Start CT/MR input DOR Test (sa1)
- 4 Start Dials Test
- 0 Return to Service Menu

**Enter the number of your choice:**

### SUN VTS Example:

[illegible]

### 5.2.2. SUNOS MENU

## SunOS Menu

- ```

1   Optical Disk Format Menu
2   SunOS: a C-shell is started in the service-directory
Type 'exit' to return to this menu.

0   Return to Service Menu

```

Enter the number of your choice:

### 5.2.3. FILE MENU

#### File Menu

- 1 Logfiles Inspection (a C-shell is started in the log directory)  
Use 'ls -l', 'more', 'tail -31l' to examine the logfiles.  
Type 'exit' to return to this menu.
- 2 Images Inspection (a C-shell is started in the images directory)  
Use 'ls -l' to examine the image files.  
Type 'exit' to return to this menu.
- 3 Create file /tmp/logfiles.zip containing logfiles and config files.
- 0 Return to Service Menu

Enter the number of your choice:

**Logfiles Inspection:** See chapter 8 EasyVision log files

**Images Inspection:** See chapter 6.4.1 /easy/service/images/import

**File Transfer:** See EasyVision Remote Service Manual

#### **Create ZipFile:**

The following protocols are available:

kermit  
rb  
rx  
rz  
sb  
sx  
sz

Files can be moved into the Zip file with long or short filenames

In case you want to use the Zip file on a DOS or MS-Windows 3.x system, you should choose for short files names. In that case the name of each file that is added to the Zip file will be converted into a number. The original names will be saved in a file "index". This index file will also be included into the Zip file (/tmp/logfiles.zip)

The next options are available:

- 1 Use short filenames
- 2 Use long filenames

Enter your choice:

### 5.2.4. PRINTER MENU

#### Printer Menu

- 1 Start Printer Status Request
- 2 Start Data Channel Printer Test  
Data is sent to the HCU via the data channel, then  
press print on the HCU control panel for output
- 3 Start Printer Test
- 4 Start S-bus Printer Interface Test (HCU testbox required)
- 5 Start S-bus Printer Visual Interface Test (Led board required)
  
- 0 Return to Service Menu

Enter the number of your choice:

For test contents see Service Manual Imager Compatibility

### 5.3. PCR SYSTEMS MENU (REMOTE)

#### SunOS 5.6

login: Service

Password: <Host ID>

Last login: Thu Sep 14 13:04:52 from 130.143.187.215

PMSN-EVM Sun Microsystems Inc. SunOS 5.6 Generic August 1997

```

+-----+
| WARNING : Access for authorised persons only |
+-----+
```

Last local login: Tue Sep 12 16:24:18 MET DST 2000

#### Service Menu

- 1 Diagnostics Menu (sunvts and product diagnostics)
- 2 SunOS Menu (optical disk format and SunOS commands)
- 3 File Menu (file transfer and manipulation commands)
- 4 Printer Menu (Printer tests)
- 5 PCR Systems (PCR diagnostics menu)
  
- 0 Logout

Enter the number of your choice: 5



**EasyVision PCR Systems Menu (remote) ...****Default Remote File Transfer Modes:****RTAC -> EV : sz/rz****EV -> RTAC : sz/rz****Compression: Zip****Could not find Release Info File for PCR User Terminal Server.  
Might be wrong release/version/level.****Press Return to continue.****PCR Systems Menu:**

- 1 File Transfer- and Compression Settings Menu**
- 2 File Transfer Menu (log and image file transfer)**

**0 Return to Main Menu****Enter the number of your choice: 1****File Transfer Settings Menu:****Actual Configuration:****EasyVision --> RTAC : sz/rz****EasyVision <-- RTAC : sz/rz****Compression : Zip**

- 1 EasyVision --> RTAC : Use kermit (works only with modem**
- 2 EasyVision <-- RTAC : Use kermit terminal connections)**
- 3 EasyVision --> RTAC : Use sz/rz (works only with modem**
- 4 EasyVision <-- RTAC : Use sz/rz terminal connections)**
- 5 EasyVision <--> RTAC : Use ftp (works only with TCP/IP,**  
**and ftp server must be**  
**running on RTAC host)**
- 6 Zip (Most used compression S/W on DOS based computer)**
- 7 UNIX compress (tar| Most used compression S/W on UNIX based computer)**

**0 Return to Service Menu****Enter the number of your choice: 5****FTP Parameter for RTAC File Transfer Menu:****Actual Settings:****RTAC host ip: service\_pc****RTAC ftp user: Service****RTAC ftp password: password****RTAC ftp directory: c:/service****C Change actual settings****D Discard changes and return to File Transfer Menu****A Accept settings and return to File Transfer Menu****Enter the number of your choice: a**

**File Transfer Settings Menu:****Actual Configuration:**

EasyVision --&gt; RTAC : ftp

EasyVision &lt;-- RTAC : ftp

Compression : Zip

1 EasyVision --&gt; RTAC : Use kermi (works only with modem

2 EasyVision &lt;-- RTAC : Use kermi terminal connections)

3 EasyVision --&gt; RTAC : Use sz/rz (works only with modem

4 EasyVision &lt;-- RTAC : Use sz/rz terminal connections)

5 EasyVision <--> RTAC : Use ftp (works only with TCP/IP,  
and ftp server must be  
running on RTAC host)

6 Zip (Most used compression S/W on DOS based computer)

7 UNIX compress (tar| Most used compression S/W on UNIX based computer)

0 Return to Service Menu

Enter the number of your choice: 0

**PCR Systems Menu:**

1 File Transfer- and Compression Settings Menu

2 File Transfer Menu (log and image file transfer)

0 Return to Main Menu

Enter the number of your choice: 2

**File Transfer Menu:**

Actual Configuration: RTAC -&gt; EasyVision: ftp

EasyVision -&gt; RTAC: ftp

Compression : Zip

1 Collect&amp;Send Logfiles

2 Send Image Files (Menu)

3 Manual File Transfer (a C-shell is started; go to the directory where  
you want to send/receive files from/into. Then  
start the desired protocol by typing its name  
followed by the appropriate arguments).

0 Return to Service Menu

Enter the number of your choice: 1

adding: config.cfg (deflated 95%) .....

adding: PTResult (deflated 54%) .....

adding: autoExportServer\_autoExport\_de25zh.env (deflated 68%)

.

.

adding: messages.1 (deflated 92%) .....

adding: messages.2 (deflated 92%) .....

collecting  
& zipping  
& transferring logfiles

The file 'evlog.zip' is sent to your terminal host via ftp.

It is put in the directory 'c:/service'.

**File transfer completed. Press Return to continue:**

**File Transfer Menu:**

**Actual Configuration: RTAC -> EasyVision: ftp  
EasyVision -> RTAC: ftp  
Compression : Zip**

- 1 Collect&Send Logfiles**
- 2 Send Image Files (Menu)**
- 3 Manual File Transfer (a C-shell is started; go to the directory where you want to send/receive files from/into. Then start the desired protocol by typing its name followed by the appropriate arguments).**

**0 Return to Service Menu**

**Enter the number of your choice: 0**

**PCR Systems Menu:**

- 1 File Transfer- and Compression Settings Menu**
- 2 File Transfer Menu (log and image file transfer)**

**0 Return to Main Menu**

**Enter the number of your choice: 0**

**Service Menu**

- 1 Diagnostics Menu (sunvts and product diagnostics)**
- 2 SunOS Menu (optical disk format and SunOS commands)**
- 3 File Menu (file transfer and manipulation commands)**
- 4 Printer Menu (Printer tests)**
- 5 PCR Systems (PCR diagnostics menu)**
- 0 Logout**

## 6. FILE SYSTEM

### 6.1. / (ROOT)

drwxr-x---	2	root	staff	512	Nov	10	22:17	APPLINST
drwxr-xr-x	2	root	root	512	Nov	11	12:58	TT_DB
lrwxrwxrwx	1	root	other	9	Nov	11	12:33	bin -> ./usr/bin
drwxr-xr-x	2	root	other	512	Nov	11	12:46	cdrom
drwxr-x---	5	EasyUser	EasyGrp	512	Nov	11	20:27	dbadmin
drwxrwxr-x	17	root	sys	3072	Nov	12	15:04	dev
drwxrwxr-x	5	root	sys	512	Nov	11	12:35	devices
drwxr-xr-x	6	root	root	512	Nov	11	12:47	easy
drwxr-xr-x	9	root	root	512	Nov	11	20:27	easydata
drwxrwxr-x	23	root	sys	3072	Nov	12	15:04	etc
dr-xr-xr-x	2	root	root	2	Nov	12	15:37	home
drwxr-xr-x	9	root	sys	512	Nov	10	22:11	kernel
lrwxrwxrwx	1	root	other	9	Nov	11	12:33	lib -> ./usr/lib
drwx-----	2	root	root	8192	Nov	10	21:22	lost+found
drwxrwxr-x	2	root	sys	512	Nov	10	21:26	mnt
dr-xr-xr-x	2	root	root	2	Nov	12	15:37	net
drwxrwxr-x	7	root	sys	512	Nov	10	22:18	opt
drwxr-xr-x	4	root	sys	1024	Nov	10	21:28	platform
dr-xr-xr-x	2	root	root	2240	Nov	12	15:37	proc
drwxrwxr-x	2	root	sys	512	Nov	10	22:13	sbin
drwxr-xr-x	4	root	root	512	Nov	11	12:35	spare
drwxrwxr-x	2	EasyUser	EasyGrp	512	Nov	11	20:30	startup
drwxrwxrwt	4	sys	sys	1024	Nov	12	15:37	tmp
drwxrwxr-x	20	root	sys	512	Nov	10	22:19	usr
drwxrwxr-x	17	root	sys	512	Nov	10	21:53	var
dr-xr-xr-x	2	root	root	2	Nov	12	15:37	xfn

APPLINST: Installation scripts  
 Cdrom: Mount point for cdrom  
 Dbadmin: Mount point for image disk  
 dev: Devices directory  
 Easy: Application binaries  
 Easydata: Application config files  
 etc: UNIX config files  
 home: Home directories for users  
 kernel: Kernel binaries  
 mnt: Mount point multi purposes  
 tmp: Temporary directory (destination logfiles.zip)  
 var: System logging

## 6.2. /DBADMIN

dbadmin is a backup directory for configuration files.

```
-rw-r----- 1 EasyUser EasyGrp 106029 Nov 11 20:27 8087f688.cus
-rw-r----- 1 EasyUser EasyGrp 8680 Nov 11 20:27 Configuration.pf
-rw-r----- 1 EasyUser EasyGrp 18747 Nov 11 20:27 config.cfg
drwxr-x--- 4 EasyUser EasyGrp 512 Nov 3 14:59 db8087f688
-rw-r----- 1 EasyUser EasyGrp 4276 Nov 11 20:27 license.dat
drwxr-x--- 2 EasyUser EasyGrp 8192 Oct 24 11:47 lost+found
drwxr-x--- 4 EasyUser EasyGrp 512 Oct 27 14:58 setup
-rw-r----- 1 EasyUser EasyGrp 635 Nov 11 20:27 usedSlices
```

8087f688.cus	Customization file
Configuration.pf	Property file, binary format
config.cfg	Configuration file
db8087f688	Database ID file, binary format
license.dat	License file
usedSlices	Overview of used slices
setup	Setup database backup directory

## 6.3. /DEV

arp	kmem	ptyp6	ptyqe	sound	ttypa	ttyr2
audio	kstat	ptyp7	ptyqf	sp	ttypb	ttyr3
audioctl	ksyms	ptyp8	ptyr0	stderr	ttypc	ttyr4
be	le	ptyp9	ptyr1	stdin	ttypd	ttyr5
bpp0	llc1	ptypa	ptyr2	stdout	ttype	ttyr6
conslog	log	ptypb	ptyr3	swap	ttypf	ttyr7
console	logindmux	typc	ptyr4	syscon	ttyq0	ttyr8
cua	md	typd	ptyr5	sys tty	ttyq1	ttyr9
dsk	mem	ptype	ptyr6	tcp	ttyq2	ttyra
dump	mouse	typf	ptyr7	term	ttyq3	ttyrb
easy	nsp	tyq0	ptyr8	ticlts	ttyq4	ttyrc
fb	null	tyq1	ptyr9	ticots	ttyq5	ttyrd
fb0	openprom	tyq2	ptyra	ticotsord	ttyq6	ttyre
fbs	printers	tyq3	ptyrb	tty	ttyq7	ttyrf
fd	profile	tyq4	ptyrc	ttyp0	ttyq8	udp
hme	ptmajor	tyq5	ptyrd	ttyp1	ttyq9	volctl
icmp	ptmx	tyq6	ptyre	ttyp2	ttyqa	winlock
ie	pts	tyq7	ptyrf	ttyp3	ttyqb	wscons
ip	ptyp0	tyq8	qe	ttyp4	ttyqc	zero
ipd	ptyp1	tyq9	rawip	ttyp5	ttyqd	zsh
ipdcm	ptyp2	tyqa	rdsk	ttyp6	ttyqe	zsh0
ipdptp	ptyp3	tyqb	rmt	ttyp7	ttyqf	zsh1
isdn	ptyp4	tyqc	rt	ttyp8	ttyr0	
kbd	ptyp5	tyqd	sad	ttyp9	ttyr1	

Overview of hardware devices.

## 6.4. /EASY/SERVICE

**Description:** Tools en utils for EasyVision Service

```
drwxr-x--- 2 root daemon 512 Nov 11 05:12 caldir
drwxr-x--- 2 root daemon 512 Nov 11 05:13 diagdir
drwxr-xr-x 3 root daemon 512 Nov 11 04:42 images
lrwxrwxrwx 1 root daemon 15 Nov 11 12:49 logdir -> /var/adm/cdslog
drwxr-x--- 2 root daemon 512 Nov 11 05:12 protocols
-rwxr-x--- 1 root daemon 332 Sep 2 16:28 removeConfigFiles
-rwxr-x--- 1 root daemon 22861 Nov 6 16:21 service_menu
-rw-r----- 1 root daemon 4449 Nov 10 16:38 service_menu.data
-rwxr-x--- 1 root daemon 114204 Nov 10 21:12 unzip
-rwxr-x--- 1 root daemon 81352 Jul 14 20:04 zip
```

### 6.4.1. /EASY/SERVICE/IMAGES/IMPORT

**Description:** Import directory for images in database, test images for monitors, printers, DICOM etc.

```
TestImage_CR0000.SPI
TestImage_CT0000.SPI
TestImage_GrayScale0000.SPI
TestImage_MR0000.SPI
TestImage_NEW_NM0000.SPI
TestImage_NEW_US0000.SPI
TestImage_NEW_USMF0000.SPI
TestImage_NEW_USMF0001.SPI
TestImage_NEW_USMF0002.SPI
TestImage_PrinterCalibration0000.SPI
TestImage_RETIREd_NM0000.SPI
TestImage_RETIREd_US0000.SPI
TestImage_RETIREd_USMF0000.SPI
TestImage_RETIREd_USMF0001.SPI
TestImage_RETIREd_USMF0002.SPI
TestImage_SC0000.SPI
TestImage_SMPTE_1K0000.SPI
TestImage_SMPTE_2560000.SPI
TestImage_SMPTE_5120000.SPI
TestImage_Wedge0000.SPI
TestImage_XA0000.SPI
TestImage_XAB0000.SPI
TestImage_XAB0001.SPI
TestImage_XRF0000.SPI
```

### 6.4.2. /EASY/SERVICE/IMAGES/EXPORT

**Description:** Export images from database (max. 5 images)

link: export -> /easydata/export\_img

## 6.5. /EASYDATA

**Description:** Configuration directory for EasyVision Application

```
-rw-r--r-- 1 root other 106029 Nov 11 20:27 8087f688.cus
-rw-r--r-- 1 root other 18747 Nov 11 20:27 config.cfg
drwxr-xr-x 2 EasyUser EasyGrp 512 Nov 11 12:48 export_img
drwxr-xr-x 2 EasyUser EasyGrp 512 Nov 11 12:48 filePrints
drwxr-xr-x 2 EasyUser EasyGrp 512 Nov 11 12:48 jpeg
-rw-r--r-- 1 root other 4276 Nov 11 20:27 license.dat
-rw-r--r-- 1 root other 4276 Nov 5 12:58 license.dat.~1~
-rw-rw-r-- 1 root EasyGrp 30 Nov 11 20:27 license.env
drwx----- 2 root root 8192 Nov 11 12:47 lost+found
-rw-rw-r-- 1 root EasyGrp 6 Nov 11 20:27 orig..language
-rw-rw-r-- 1 root EasyGrp 4276 Nov 11 20:27 orig.license.dat
-rw-rw-r-- 1 root EasyGrp 30 Nov 11 20:27 orig.license.env
drwxr-xr-x 2 EasyUser EasyGrp 512 Nov 11 12:48 pictures
drwxr-xr-x 2 EasyUser EasyGrp 512 Nov 11 20:27 prop
-rw-rw-r-- 1 root EasyGrp 15639 Nov 11 20:27 rebootData
drwxr-xr-x 2 EasyUser EasyGrp 512 Nov 11 12:48 text
```

**license.dat:** License file for EasyVision application

Example:

```
SERVER ev1 8087f688 2900
DAEMON easylicd /easy/appl/bin
INCREMENT EasyServer      easylicd 4.100 01-may-1998 1 3C237534749A7547D247
" " 8087f688
INCREMENT EasyClient      easylicd 4.100 01-may-1998 1 8C9365C43C3A52289E8F
" " 8087f688
INCREMENT EasyReview      easylicd 4.100 01-may-1998 1 4C3375A46690863BDD5B
" " 8087f688
INCREMENT Navigator       easylicd 4.100 01-may-1998 1 6C2315449AA892663DB3
" " 8087f688
INCREMENT EasyView        easylicd 4.100 01-may-1998 1 9CD3A5F4F74B79D5A525
" " 8087f688
INCREMENT BolusChaseClient easylicd 4.100 01-may-1998 1 9CB3B594FEA144DC93F0
" " 8087f688
INCREMENT BolusChaseServer easylicd 4.100 01-may-1998 1 DC93B5A49E583F882E50
" " 8087f688
INCREMENT SpineClient      easylicd 4.100 01-may-1998 1 8CC3E5A4C0484F6AF994
" " 8087f688
INCREMENT SpineServer      easylicd 4.100 01-may-1998 1 8CA3F5E4D0303A2DF803
" " 8087f688
INCREMENT ColonMap         easylicd 4.100 01-may-1998 1 3C6385E41183B87045DF
" " 8087f688
```

### Explanation:

SERVER ev1 8087f688 2900 : EasyVision Name(ev1), Host-ID (8087f688), and portnumber (2900)

```
INCREMENT EasyCorrect      easylicd 4.100 01-may-1998 1 CC63A51428AD7C3FEF38
" " 8087f688
```

Comment	Application	Host-ID	License Prog.	Expiration date	Key
---------	-------------	---------	---------------	-----------------	-----

## 6.6. /ETC

**Description:** Config directory for Solaris. See manual pages for description.

SUNWconn	hosts	nsswitch.nis	saf
TIMEZONE	hosts.equiv	nsswitch.nisplus	security
aliases	inet	opt	services
asppp.cf	inetd.conf	orig.asppp.cf	setmnt
auto_home	init	orig.defaultdomain	shadow
auto_master	init.d	orig.defaultrouter	shutdown
autopush	initpipe	orig.gateways	skel
clri	inittab	orig.hostname.le0	sulogin
crash	install	orig.hosts.equiv	swap
cron	ioctl.syscon	orig.nodename	swapadd
cron.d	iu.ap	passwd	sysdef
dcopy	killall	path_to_inst	syslog.conf
default	labelit	path_to_inst.old	syslog.pid
device.tab	lib	profile	system
devlink.tab	log	protocols	tar
dfs	logindevperm	prtconf	telinit
dgroup.tab	magic	prvtoc	tm
dorformat.dat	mail	publickey	ttydefs
driver_aliases	minor_perm	rc0	ttysrch
driver_classes	mkfs	rc0.d	uadmin
dumpdates	mknod	rc1	umount
ff	mnttab	rc1.d	umountall
fmthard	motd	rc2	utmp
format	mount	rc2.d	utmppipe
format.dat	mountall	rc3	utmpx
fs	name_to_major	rc3.d	uucp
fsck	name_to_sysnum	rc5	vfstab
fsdb	ncheck	rc6	volcopy
fstyp	net	rcS	vold.conf
ftpusers	netconfig	rcS.d	wall
gateways	netmasks	reboot	whodo
getty	networks	remote	wtmp
group	nodename	rmmount.conf	wtmpx
grpck	nsd.conf	rmt	
halt	nsswitch.conf	rpc	
hostname.le0	nsswitch.files	rpld.conf	

### gateways:

```
net 192.168.15.0    gateway 192.168.12.80    metric 1    passive
```

Explanation:

The **gateway** (router) for **net** 192.168.15 is 192.168.12.80

**1:** Value for **metric** indicating the hop count to the destination host or network.

Gateways specified in this manner should be marked **passive** if they are not expected to exchange routing information, while gateways marked **active** should be willing to exchange routing information (that is, they should have an in-routed process running on the machine). Passive gateways are maintained in the routing tables forever.



**hosts:**

The hosts file is a local database that associates the names of hosts with their Internet Protocol (IP) addresses. The hosts file can be used in conjunction with, or instead of, other hosts databases, including the Domain Name System (DNS), the NIS hosts map and the NIS+ hosts table. Programs use library interfaces to access information in the hosts file.

The hosts file has one entry for each IP address of each host. If a host has more than one IP address, it will have one entry for each, on consecutive lines.

```
#
# Sun Host Database
#
# If the NIS is running, this file is only consulted when booting
#
127.0.0.1      localhost
#
192.168.12.64  ev1 loghost
222.222.222.221 evppp
222.222.222.222 remoteppp
192.168.12.80  ev2
```

**Explanation:**

```
127.0.0.1      localhost for loopback
192.168.12.64  ev1 loghost own IP-address, always followed by loghost
222.222.222.221 evppp own PPP connection IP address
222.222.222.222 remoteppp remote PPP connection address
192.168.12.80  ev2 other host
```

**6.7. /VAR**

```
drwxrwxr-x    6 root    sys          512 Dec  2 10:24 adm
drwxr-xr-x    2 root    sys          512 Dec  2 14:01 audit
drwxr-xr-x    2 root    sys          512 Dec  1 14:47 cron
drwxr-xr-x    2 root    sys          512 Nov 28 19:22 log
drwx-----   2 root    root      8192 Nov 28 19:18 lost+found
drwxrwxrwt    3 root    mail       512 Nov 28 19:21 mail
drwxrwxrwx    2 bin     bin        512 Nov 28 19:21 news
drwxr-xr-x    2 root    sys          512 Nov 28 19:42 nis
drwxrwxr-x    3 root    sys          512 Dec  2 14:22 opt
drwxrwxrwx    2 bin     bin        512 Nov 28 19:21 preserve
drwxr-xr-x    8 root    sys          512 Nov 28 19:51 sadm
drwxr-xr-x    4 bin     bin        512 Dec  1 14:47 saf
drwxrwxr-x    6 root    bin        512 Nov 28 19:21 spool
drwxrwxrwt    3 sys     sys          512 Dec  2 14:22 tmp
drwxr-xr-x    3 bin     bin        512 Nov 28 19:42 yp
```

<b>audit:</b>	watchdog
<b>cron:</b>	timer
<b>log:</b>	logging
<b>mail:</b>	not used
<b>news:</b>	not used
<b>Spool:</b>	printer spooling

### 6.7.1. /VAR/ADM

```

-rw----- 1 uucp      bin           0 Nov 28 19:22 aculog
drwxr-x--- 3 EasyUser EasyGrp      3072 Dec  2 16:18 cdslog
-r--r--r-- 1 root     other        33628 Dec  2 16:09 lastlog
drwxrwxr-x 2 adm      adm           512 Dec  1 14:47 log
-rw-rw-rw- 1 root     root         48705 Dec  2 16:16 messages
drwxrwxr-x 2 adm      adm           512 Nov 28 19:21 passwd
drwxrwxr-x 2 root     sys           512 Nov 28 20:01 sa
-rw-rw-rw- 1 bin      bin           0 Nov 28 19:22 spellhist
-rw----- 1 root     root          295 Dec  2 12:39 sulog
-rw-r--r-- 1 root     bin           396 Dec  2 16:09 utmp
-rw-r--r-- 1 root     bin          4092 Dec  2 16:09 utmpx
-rw-rw-rw- 1 root     root           672 Dec  2 14:01 vold.log
-rw-rw-r-- 1 adm      adm          8316 Dec  2 16:09 wtmp
-rw-rw-r-- 1 adm      adm         85932 Dec  2 16:09 wtmpx

```

### 6.7.2. /VAR/ADM/CDSLOG

For description see 8.1 Error and Process logfiles.

```

autoExportServer_autoExport_ev1.env
autoExportServer_autoExport_ev1.log
autoExportServer_autoExport_ev1.startup
computeServer_compute_ev1.env
computeServer_compute_ev1.log
computeServer_compute_ev1.startup
dbServer_db8087f688.env
dbServer_db8087f688.log
dbServer_db8087f688.startup
deleteServer_delete_ev1.env
deleteServer_delete_ev1.log
deleteServer_delete_ev1.startup
dorServer_dor_ev1.env
dorServer_dor_ev1.log
dorServer_dor_ev1.startup
hcServer_hcs0_ev1.env
hcServer_hcs0_ev1.log
hcServer_hcs0_ev1.startup
httpServer_http_ev1.env
httpServer_http_ev1.log
httpServer_http_ev1.startup
lmgrd.startup
networkServer_export_ev1.env
networkServer_export_ev1.log
networkServer_export_ev1.startup
networkServer_import_ev1.env
networkServer_import_ev1.log
networkServer_import_ev1.startup
setup
setupDbServer_setup.env
setupDbServer_setup.log
setupDbServer_setup.startup
systemMonitor_systemMonitor_ev1.env
systemMonitor_systemMonitor_ev1.log
systemMonitor_systemMonitor_ev1.startup
template.env
uiDataHandling_uiDataHandling_ev1.env
uiDataHandling_uiDataHandling_ev1.log
uiDataHandling_uiDataHandling_ev1.startup
up
uiDentalView_uiDentalView_ev1.env
uiDentalView_uiDentalView_ev1.log
uiDentalView_uiDentalView_ev1.startup
uiPerfusion_uiPerfusion_ev1.env
uiPerfusion_uiPerfusion_ev1.log
uiPerfusion_uiPerfusion_ev1.startup
uiRF_uiRF_ev1.env
uiRF_uiRF_ev1.log
uiRF_uiRF_ev1.startup
uiStackView_uiStackView_ev1.env
uiStackView_uiStackView_ev1.log
uiStackView_uiStackView_ev1.startup
uiVolume_uiVolume_ev1.env
uiVolume_uiVolume_ev1.log
uiVolume_uiVolume_ev1.startup
xConfig_xConfig.env
xConfig_xConfig.log
xConfig_xConfig_ev1.startup
xEasyReview_xEasyReview_ev1.env
xEasyReview_xEasyReview_ev1.log
xEasyReview_xEasyReview_ev1.startup

```

## 6.8. DISK OCCUPATION (EXAMPLE)

Using the UNIX command **df** will report the number of free disk blocks and files:

```
# df

/                (/dev/dsk/c0t3d0s0 ):    61996 blocks    32624 files
/usr             (/dev/dsk/c0t3d0s6 ):    97250 blocks    68917 files
/proc            (/proc                ):         0 blocks      52 files
/dev/fd          (fd                  ):         0 blocks      0 files
/var             (/dev/dsk/c0t3d0s3 ):    90182 blocks    27819 files
/spare           (/dev/dsk/c0t3d0s7 ):   251450 blocks    62651 files
/easydata        (/dev/dsk/c0t3d0s5 ):  1924738 blocks   484128 files
/easy            (/dev/dsk/c0t3d0s4 ):   153434 blocks    89551 files
/dbadmin         (/dev/dsk/c0t2d0s5 ):    68554 blocks    51231 files
```

Using the UNIX command **df -k** will report the number of free disk blocks and files per filesystem:

```
# df -k

Filesystem      kbytes    used    avail capacity  Mounted on
/dev/dsk/c0t3d0s0  67815    36817    24218     61%    /
/dev/dsk/c0t3d0s6 153951   105326    48625     69%    /usr
/proc            0         0         0         0%    /proc
fd               0         0         0         0%    /dev/fd
/dev/dsk/c0t3d0s3  48023     2932    40291      7%    /var
/dev/dsk/c0t3d0s7 125735      10   113155      1%    /spare
/dev/dsk/c0t3d0s5  962582     213   866119      1%    /easydata
/dev/dsk/c0t3d0s4 176815   100098    76717     57%    /easy
/dev/dsk/c0t2d0s5  95992    61715    24687     72%    /dbadmin
```

The **du -skd** command shows the number of kilobytes occupied by a directory and recursively all its subdirectories and files, but within the file system boundaries. The figures do not include log files and exported image files in UNIX format.

## 7. FILE TRANSFER

### 7.1. SERIAL PORT

1. Connect the Service-PC (See Service Manual) to serial port B and boot it.
2. Insert the Communication-disc (4522 220 84831), delivered with the system into drive A.
3. Execute the following procedure:

C > a:

Go to drive a:

A > kermi

Start kermi program.

If the screen stays black: press RETURN

ttyb login: Service

Login on the EasyVision.

Password:8083e3bd

Password is the hostid number of the EasyVision workstation.

5. Select option **3** "File Menu" in the Service Menu.
6. Select option **3** "File Transfer".
7. Enter as follows:

EV1# cd /easydata

Connect to directory /easydata

EV1# kermi

Start kermi on the EasyVision.

C-Kermi> Server

Put kermi into Server mode.

KERMIT READY TO SERVE

Response of entering the Server mode.

Alt-X

Back to the service-PC.

MS-Kermi> get /easydata/\*.cus

Get the customize file from EasyVision to the disc.

MS-Kermi> send /easydata/\*.cus

Send the customize file from EasyVision to the disc.

#### **NOTE**

*To send/get the customization file are just examples*

8. To disconnect type:

MS-Kermi> finish

Stop the Server mode of the remote kermi.

MS-Kermi> connect

Go to EasyVision.

C-Kermi> quit

Stop the remote kermi.

EV1# exit

Back to the Service Menu

9. Select option **0** twice to logout:

ttyb login:

Back at the login prompt of the EasyVision.

Alt-X

Back to the service-PC.

MS-Kermi> quit

Stop the kermi program on the service PC.

A>

DOS-prompt.

## 7.2. FLOPPY DRIVE

### NOTE

*Insert floppy into drive before mounting it.*

---

1. Goto Service Menu
2. Select option 2 "Sun Os Menu"
3. Select option 3 "SunOS: OpenWindows"

Open Windows is started

4. Open command tool (Right mouse click on canvas)
5. Host\_name#cd / (Goto root directory)

If directory /floppy does not exists do:

6. Host\_name#mkdir /floppy (create mounting point for floppy drive)
7. Host\_name#mount -F pcfs /dev/diskette /floppy (mount floppy as DOS filesystem)
8. Host\_name#cd /floppy

From now on the floppy drive is mounted to the directory /floppy

#### Examples:

To list files on floppy:

Host\_name#ls (lists floppy contents)

To copy license file to EasyVision:

Host\_name#cp host-id.dat /easydata/license.dat (host-id 8 digit hex code)

To copy EasyVision zipped logfiles to floppy:

Host\_name#cp /tmp/logfiles.zip /floppy (logfiles.zip created in Service Menu)

To copy EasyVision backup files to floppy:

Host\_name#cp /easydata/config.cfg /floppy

Host\_name#cp /easydata/\*.cus /floppy

Host\_name#cp /easydata/\*.cal /floppy

9. To unmount floppy:  
Host\_name#cd / (Goto root directory, otherwise it will not unmount)  
Host\_name#eject floppy or Host\_name#umount /floppy

### WARNING

You must unmount the floppy. If you don't the floppy data will be damaged!

---

## 8. EASYVISION LOG FILES

EasyVision R4.1 is able to create one .ZIP archive with all logfiles, configuration files, etc. See paragraph 5.2.3 File Menu. This Zip file must be sent to Helpdesk DMC-RAD Hamburg in case of problems.

Overview logfiles:	error.log	critical error logfile
	<process>.log	process logfiles
	Lmgrd.startup	license logfile
	install.log	installation logfile
	net_impo	network import messages file
	get net_expo	network export messages file
	get sun_confi	SUN Configuration / DICOM Association messages file

### 8.1. ERROR AND PROCESS LOGFILES

This section describes which logfiles are available in the /var/adm/cdslog directory for EasyVision software diagnostics.

The logging mechanism writes information in two files:

- error log file: /var/adm/cdslog/error.log
- process log file: /var/adm/cdslog/<process>.log

The error log file contains only messages that are generated at:

- application crash
- software error exit

For each process a separate logfile is created. It contains the following information:

- More elaborate information about a process crash or error exit,
- All other log messages generated by the process,
- Output of statistics measurements.

### 8.2. COLLECTING AND ZIPPING ALL LOGFILES

From the Start Menu select

- 2 Go to Service Menu  
Password: 'password'
- 3 File Menu: *(the File Menu will be displayed)*
- 3 Create file **/tmp/logfiles.zip** containing logfiles and config file

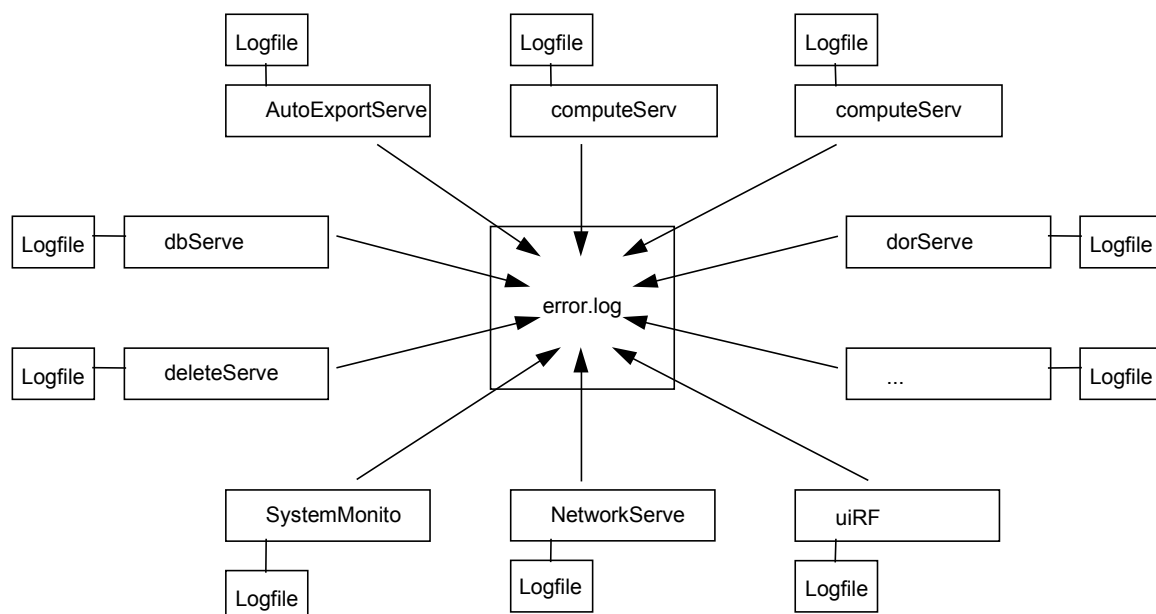
If there are any problems with the EasyVision RAD or the whole system which need to be investigated create this zipped logfile as soon as possible or have it done by the personel on site. Logfiles possibly containing the error data will then not be overwritten.

### 8.2.1. LOGFILES EASYVISION RAD 4.2

The most important logfiles:

- autoExportServer\_autoExport\_de25zu.log
- cdRecordableServer\_cdRecordable\_de25zu.log
- computeServer\_compute\_de25zu.log
- dbServer\_db809f894d.log
- deleteServer\_delete\_de25zu.log
- hcRqs.log
- cServer\_hcs0\_de25zu.log
- httpServer\_http\_de25zu.log
- networkReaderServer\_dmsReader\_de25zu.log
- networkReaderServer\_networkReader\_de25zu.log
- networkServer\_export\_de25zu.log
- networkServer\_import\_de25zu.log
- printJobServer\_printJob\_de25zu.startup
- setupDbServer\_setup.log
- systemMonitor\_systemMonitor\_de25zu.log
- uiBMD\_uiBMD\_de25zu.log
- iDataHandling\_uiDataHandling\_de25zu.log
- uiPerfusion\_uiPerfusion\_de25zu.log
- uiRF\_uiRF\_de25zu.log
- uiRad\_uiRad\_de25zu.log
- uiStackView\_uiStackView\_de25zu.log
- uiVolume\_uiVolume\_de25zu.log
- xConfig\_xConfig.log
- xCustomize\_xCustomize.log
- xEasyReview\_xEasyReview\_de25zu.log
- xUiEdit\_xUiEdit.log

Overview:



The main header for a Process logfiles is described below

The next example shows the main part of the .log files.  
(Example taken from the setup DbServer\_setup.log file)

Process id  
\_\_\_\_\_ | \_\_\_\_\_

```
Oct 27 14:59:00 1997:      === log opened for setupDbServer_setup      (pid 563)
===
```

```
Hostname:   EV1
Host id:    8087f688
Version:    EasyVision R4.1
Hospital:   Customer Support
Department: Service
```

### 8.3. SYSTEMMONITOR

The system Monitor performs the task to run other processes. If a process crashes, the system monitor tries to restart that process. It also knows if a process is critical or not, and can decide to stop that specific program or to stop the whole application.

```
Critical processes:      dBServer
                        SetupServer
```

```
Non-critical processes:  a specific application, e.g. BCR, 3D etc
                        http server
```

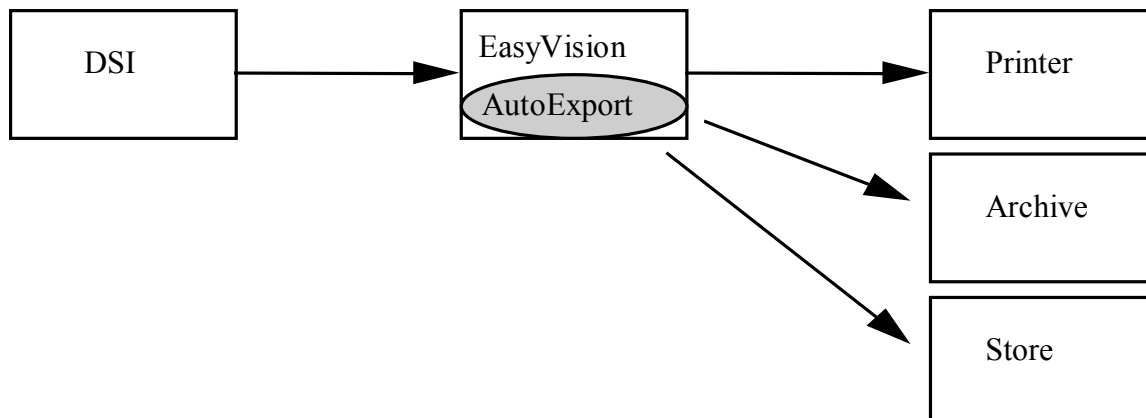
### 8.4. SERVER LOGFILES

Each process has its own error log files. It depends on which configuration (software options) you have what logfiles are written in the logfile directory.



### 8.4.1. AUTOEXPORT SERVER

This process is responsible for all auto export actions.



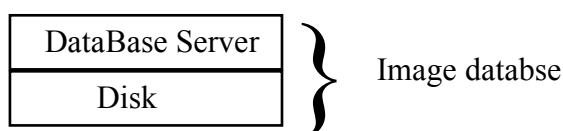
In the automatic routing panel (Customizing) the different destinations can be set.

### 8.4.2. COMPUTESERVER

The compute server performs tasks for other facilities, such as 3D calculation, BCR, etc.

### 8.4.3. DBSERVER

The database server handles all read, write, seek etc actions in the image database.



### 8.4.4. DELETESERVER

The delete server is a process that performs several possibilities of deletion tasks. These tasks can be configured on the Customizing panel. For example, Protect, Protect until printed, Protect until stored on optical disk, Auto-expiration Interval of 12 hours etc.

### 8.4.5. DORSERVER

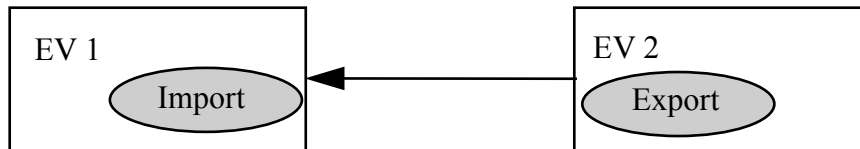
This server handles the optical disk as a normal image database.

#### 8.4.6. HTTPSERVER

Serves http requests over serial (PPP) or network.

#### 8.4.7. NETWORKSERVER

There are two network servers: import and export.



#### 8.4.8. SETUPDBSERVER

The setup database server handles the configuration of a system. The setupDbServer runs on the Server system. Once the Server system is running, the clients can take their own configuration and the configuration of the remote hosts or modalities from the setup database. In case of a stand-alone, the Server is integrated in the same machine.

#### 8.4.9. UI<...>

The ui? processes, e.g. uiRF, uiVolume, (dependent of applications) give detailed information about the packages mentioned with the question mark.

If such an application is unstable, messages are written in the ui? logfile. If a critical error occurs, this error is also written in the error.log file.

## 8.5. LICENSE LOGFILE LMGRD.STARTUP

### WARNING

*The Application will not start with a wrong or corrupted license file (/easydata/license.dat)!*

---

The license manager checks if the license is correct for the requested application. Without a license for a specific package it is impossible to run that application. The license.dat file has been uploaded in the /easydata directory. Only in case of a Server or Standalone:

#### Wrong Host-ID Example:

```
17:01:39 (lmgrd) FLEXlm (v5.12a) started on ev1 (Sun) (12/10/1997)
17:01:39 (lmgrd) FLEXlm Copyright 1988-1996, Globetrotter Software, Inc.
17:01:39 (lmgrd) World Wide Web: http://www.globetrotter.com
17:01:39 (lmgrd) License file: "/easydata/license.dat"
17:01:39 (lmgrd) Starting vendor daemons ...
17:01:39 (lmgrd) Started easylicd (internet tcp_port 32810 pid 2336)
17:01:39 (easylicd) Wrong hostid, exiting (expected 8087f687, got 8087f688).
17:01:39 (lmgrd) Please correct problem and restart daemons
17:01:45 (lmgrd) lmgrd will now shut down all the vendor daemons
```

## 8.6. INSTALLATION LOGFILE

The installation logfile install.log can be found in the /var/adm/cdslog/setup directory. In this file errors during installation are written. See 9.3 Installation logfile install.log.

## 8.7. NETWORK LOGFILES

This chapter describes how to read the EasyVision Network logging (GCOM/DICOM). By using DICOM examples the main parts of the logfile are mentioned, because it is not possible to write down all the logging messages with their appropriate explanation.

The next paragraph describes how to download the logfiles to your PC (e.g. for sending logfiles to Philips Medical Systems in Best). Of course you can view the logfiles by means of the **cat** command or by using the **vi** editor on the EasyVision.

- 1 Connect the service PC to serial port B of EasyVision and run the KERMIT program which is delivered with the system (communication floppy).
- 2 Ttyb login : Service  
Password : xxxxxxxx Host ID number of EasyVision
- 3 Choose in the Service Menu "File Transfer"
- 4 <IP nodename># cd /var/adm/cdslog - Connect to directory /var/adm/cdslog  
<IP nodename># kermi - Start kermi on the EasyServer  
C-kermi> server - Put kermi into server mode  
Alt-x - Back to the service PC.
- 5 MS-Kermi> get net\_impo - Network import messages file  
MS-Kermi> get net\_expo - Network export messages file  
MS-Kermi> get sun\_conf - SUN Configuration / DICOM Association messages file
- 6 To disconnect, type  
  
MS-Kermi> finish - Stop the server mode of the remote kermi  
MS-Kermi> connect - Go to EasyVision  
C-Kermi> quit - Stop the remote kermi  
<Host ID># exit - Back to the Service Menu.

Select option : "Logout" in the service menu.

## 8.8. TCP CONNECTION

First of all a TCP connection is created between the hosts who want to communicate via the DICOM protocol. The following example gives the connection between an EasyVision (EV1) and a DICOM node (DICOM1) at port 50082. In fact the DICOM connection is initiated at the port (DICOM listen port) written in the Conformance Statement, but the child process is transferred to port 50082. Now the server can start another TCP connection.

The next line is written in the logfile:

```
Jul 25 10:06:23 EV1 sunConfig: Info:CREATED TCP CONNECTION from host: [EV1] to
host: [DICOM1] at port: [50082].
```

When the TCP connection is released the following line appears in the logfile

```
Jul 25 10:06:26 EV1 sunConfig: Info:RELEASED TCP CONNECTION from host: [EV1] to
host: [DICOM1].
```

## 8.9. ASSOCIATION PDU TYPES

The Protocol Data Units (PDUs) are the DICOM packets (containing messages/data/comments) exchanged between peer entities within a DICOM layer. It consists of protocol control information and user data. PDUs are constructed by mandatory fixed fields followed by optional variable fields that contain one or more items and/or sub-items.

After creating a TCP connection the PDU types are associated. The EasyVision sends a PDU type to the remote DICOM node as the requestor.

```
Jul 25 10:06:23 EV1 sunConfig: Info:SENT: [ASSOCIATE_RQ_PDU_TYPE] from: [EV1] to
: [DICOM1].
```

Next the EasyVision receives a PDU type from the remote DICOM node. The remote DICOM node is the acceptor.

If these services are confirmed a DICOM association is made:

```
Jul 25 10:06:25 EV1 sunConfig: Info:ESTABLISHED DICOM ASSOCIATION from: [EV1] to
: [DICOM1].
```

If not, messages like these are written:

```
Jul 25 10:06:25 EV1 sunConfig: Info:[049SBCDC01DIC1] REJECTS following
PRESENTATION CONTEXTS from: [EV1]:
```

ID	ABSTRACT_SYNTAX	TRANSFER_SYNTAX
REJECT_REASON		
007	1.2.840.10008.5.1.4.1.1.1	1.2.840.10008.1.2.4.70

This means that the abstract syntax CR-Image Store via the transfer syntax JPEG Lossless (see DICOM Conformance Statement) is not accepted.

## 8.10. ACCEPTED PRESENTATION CONTEXTS

Once the DICOM association is confirmed the accepted presentation context are written in the logfile:

ACCEPTED PRESENTATION CONTEXTS:

ID	ABSTRACT_SYNTAX	TRANSFER_SYNTAX
001	1.2.840.10008.5.1.4.1.1.1	1.2.840.10008.1.2
003	1.2.840.10008.5.1.4.1.1.1	1.2.840.10008.1.2.1
005	1.2.840.10008.5.1.4.1.1.1	1.2.840.10008.1.2.2
009	1.2.840.10008.5.1.4.1.1.2	1.2.840.10008.1.2
011	1.2.840.10008.5.1.4.1.1.2	1.2.840.10008.1.2.1
013	1.2.840.10008.5.1.4.1.1.2	1.2.840.10008.1.2.2
017	1.2.840.10008.5.1.4.1.1.4	1.2.840.10008.1.2
019	1.2.840.10008.5.1.4.1.1.4	1.2.840.10008.1.2.1
021	1.2.840.10008.5.1.4.1.1.4	1.2.840.10008.1.2.2
025	1.2.840.10008.5.1.4.1.1.5	1.2.840.10008.1.2
027	1.2.840.10008.5.1.4.1.1.5	1.2.840.10008.1.2.1
029	1.2.840.10008.5.1.4.1.1.5	1.2.840.10008.1.2.2
033	1.2.840.10008.5.1.4.1.1.6	1.2.840.10008.1.2
035	1.2.840.10008.5.1.4.1.1.6	1.2.840.10008.1.2.1
037	1.2.840.10008.5.1.4.1.1.6	1.2.840.10008.1.2.2
041	1.2.840.10008.5.1.4.1.1.7	1.2.840.10008.1.2
043	1.2.840.10008.5.1.4.1.1.7	1.2.840.10008.1.2.1
045	1.2.840.10008.5.1.4.1.1.7	1.2.840.10008.1.2.2

In this example CR-Image Storage (1.2.840.10008.5.1.4.1.1.1) is accepted via Implicit VR Little Endian (1.2.840.10008.1.2), Explicit VR little Endian (1.2.840.10008.1.2.1), and Explicit VR Big Endian (1.2.840.10008.1.2.2).

This also is valid for: CT-Image Storage, MR-Image Storage, NM-Image Storage, US-Image Storage and SC-Image Storage (See the Conformance Statement for detailed information).

## 8.11. LOCAL / PEER INFORMATION

After the accepted presentation context tables are written in the logfile, the LOCAL / PEER parameters are displayed.:

```

ApplicationContextName:      [1.2.840.10008.3.1.1.1]
LOCALMaxDataPDULength:     [0]
PEERMaxDataPDULength:      [16384]
LOCALImplementationClassUID: [1.3.46.670589.5.2.2]
PEERImplementationClassUID: [1.3.12.2.1107.5.1995.1]
LOCALImplementationVersionName: [EVCTMR21]
PEERImplementationVersionName: [SIEMENS_DICOM_10]
MaxOperationsInvoked:       [1]
MaxOperationsPerformed:     [1]

```

### 8.11.1. APPLICATION CONTEXT NAME

Two Application Entities establish an association by agreeing on an application context. The requester of an association proposes an Application Context Name and the acceptor returns either the same or a different Application Context Name. The returned name specifies the application context to be used for this association.

According to the DICOM Standard a single DICOM Application Context Name is "1.2.840.10008.3.1.1.1".

### 8.11.2. LOCAL MAX DATA PDU LENGTH

According to the DICOM standard a PDU Length of 0 means that the maximum length is unlimited. Some DICOM nodes do not understand a maximum PDU length of 0 bytes. The following error message is written:

```
Jul 25 10:06:30 EV1 sunEasyVision: ObjC [nil@0x0] Received: [DATA_TF_PDU_TYPE]
has unexpected PDULength : [0], expected > [6]. -- (TBX,W)
```

In this case a PDU length = 0, but the remote system expects a value greater than 6 bytes (header). In fact it expects 6 bytes plus the real PDU length or shorter.  $0 < x \leq \text{PDU length}$

The DICOM association shall be disconnected because of the invalid PDU Length:

```
Jul 25 10:06:30 EV1 sunEasyVision: ObjC [DULConnection@0xdd9328 __abort:reason:]
Sent: [ABORT_PDU_TYPE] with SOURCE: [ABORT_AS_DUL_PROVIDER] and REASON:
[ABORT_INVALID_PDU_PARAMETER] from: [EV1] to: [DICOM1] (aborting...). -- (TBX,W)
Jul 25 10:06:30 EV1 sunEasyVision: Info:RELEASED TCP CONNECTION from host: [EV1]
to host: [DICOM1].
```

### 8.11.3. PEER MAX DATA PDU LENGTH

The maximum PDU length the remote DICOM node can handle. In this case a maximum of 16384 bytes is allowed.

### 8.11.4. IMPLEMENTATION IDENTIFICATION NOTIFICATION

The implementation identification notification allows implementations of communicating AEs to identify each other at Association establishment time. It is intended to provide respective (each network node knows the other's implementation identity) and non-ambiguous identification in the event of communication problems encountered between two nodes. This negotiation is required.

Implementation identification relies on two pieces of information:

- Implementation Class UID (required);
- Implementation Version Name (optional).

<b>LOCALImplementationClassUID:</b>	defined registered value by the ISO
<b>PEERImplementationClassUID:</b>	defined registered value by the ISO
<b>LOCALImplementationVersionName:</b>	The version name extracted from the EasyVision software. For example: EVXR31. EVCTMR21.
<b>PEERImplementationVersionName:</b>	The implementation version name of the remote DICOM node.

### 8.11.5. MAX OPERATIONS

The maximum number of outstanding operations and/or sub-operations it may invoke or performed asynchronously.

The EasyVision does not support asynchronous operations. (see Conformance Statement)

### 8.12. VERIFYING SYNTAXES

The verifying of the DICOM syntaxes starts with (e.g. verifying SC-Image Store):

```
Mar 17 11:14:23 EV1 networkServer_network_EV1: Info:START VERIFYING:
[1.2.840.10008.5.1.4.1.1.7] from: [EV1] to: [DICOM1]
```

Next a syntax check is written:

```
Mar 17 11:14:23 EV1 networkServer_network_EV1: Info:LOG: 1, REPAIR: 1,
SYNTAX_CHECK: 1, REJECT: 1, PMSNET: 0, GCOM: 0, PURE: 0.
```

LOG:	boolean	1: logging per attribute	0: no specific logging per attribute
REPAIR:	boolean	1: repair attribute	0: not repair attribute
REJECT:	boolean	1: do not put image in database	0: put image in database
PMSNET:	boolean	1: convert to PMSNet	0: do not convert PMSNet
GCOM:	boolean	1: convert to GCOM	0: do not convert GCOM
PURE:	boolean	1: accept only DICOM attributes	0: do not accept only DICOM attributes

(See the advanced DICOM menu configuration for changing LOG, REPAIR, REJECT, PURE)

#### 8.12.1. SYNTAX ERRORS

If syntax errors occur lines like following messages are written in the logfile:

```
Aug 13 13:05:54 EV1 networkServer_import_EV1: Info:BasicVerifier: repaired DICOM
attribute (0x0008, 0x0023) [SPI_IMAGE_DATE]
```

In this case a DICOM attribute (Image date) is repaired.

Another examples gives a syntax check where PURE is set to 0:

```
Mar 17 11:14:24 EV1 networkServer_network_EV1: Info:NON PURE DICOM attribute:
(0x0011, 0x1110) [SPI_PATIENT_ENTRY_ID]
Mar 17 11:14:24 EV1 networkServer_network_EV1: Info:NON PURE DICOM attribute:
(0x0009, 0x1051) [SPI_STUDY_UNIQUE_IDENTIFIER]
```

In this case all Non Pure DICOM attribute (0x0011, 0x1110 and 0x0009, 0x1051) are not accepted.



### 8.13. CLOSING DICOM CONNECTION

Closing a DICOM connection is done via:

```
Jul 25 10:06:25 EV1 sunConfig: Info:SENT: [RELEASE_RQ_PDU_TYPE] from: [EV1] to:
[DICOM1].
Jul 25 10:06:26 EV1 sunConfig: Info:RECEIVED: [RELEASE_RP_PDU_TYPE] from:
[DICOM1] to: [EV1].
Jul 25 10:06:26 EV1 sunConfig: Info:RELEASED TCP CONNECTION from host: [EV1] to
host: [DICOM1].
```

First of all the requestor sends a PDU Type release to the remote DICOM node. Next a response is received, and finally the TCP connection is closed.

## 9. LOGFILE EXAMPLES

Refer to **bold** sections in Lmgrd.startup and systemMonitor

### 9.1. LMGRD.STARTUP

```

16:56:14 (lmgrd) -----
16:56:14 (lmgrd)   Please Note:
16:56:14 (lmgrd)
16:56:14 (lmgrd)   This log is intended for debug purposes only.
16:56:14 (lmgrd)   There are many details in licensing policies
16:56:14 (lmgrd)   that are not reported in the information logged
16:56:14 (lmgrd)   here, so if you use this log file for any kind
16:56:14 (lmgrd)   of usage reporting you will generally produce
16:56:14 (lmgrd)   incorrect results.
16:56:14 (lmgrd) -----
16:56:14 (lmgrd)
16:56:14 (lmgrd) FLEXlm (v5.12a) started on ev1 (Sun) (12/10/1997)
16:56:14 (lmgrd) FLEXlm Copyright 1988-1996, Globetrotter Software, Inc.
16:56:14 (lmgrd) World Wide Web:  http://www.globetrotter.com
16:56:14 (lmgrd) License file:  "/easydata/license.dat"
16:56:14 (lmgrd) Starting vendor daemons ...
16:56:14 (lmgrd) Started easylicd (internet tcp_port 32796 pid 1413)
16:56:15 (easylicd) Server started on ev1 for:   EasyServer
16:56:15 (easylicd) EasyClient  EasyReview      Navigator
16:56:15 (easylicd) EasyView    BolusChaseClient BolusChaseServer
16:56:15 (easylicd) SpineClient SpineServer      ColonMap
16:56:15 (easylicd) XrayCardio XrayVascular  EasyCorrect
16:56:15 (easylicd) Stackview  Dental          Volume
16:56:15 (easylicd) 3dBasicSurface 3dVolume      3dAdvSegmentation
16:56:15 (easylicd) 3dCTMRAngio 3dCTMRMatching 3dEndoView
16:56:15 (easylicd) MRCardio CTMRPerfusion DynamicContrast
16:56:15 (easylicd) BrainPerfusion EasyPrint      Communication
16:56:15 (easylicd) GCOMCommunication DSLCommunication EasyStoreODClient
16:56:15 (easylicd) EasyStoreODServer EasyStoreCDRClient CTMRODInput
16:56:15 (easylicd) RIS          NetView          CCWCommunication
16:56:15 (easylicd) TestSoftwareKeys
17:00:09 (easylicd) OUT: "EasyView" EasyUser@ev1
17:00:30 (easylicd) IN: "EasyView" EasyUser@ev1

17:00:31 (lmgrd) lmgrd will now shut down all the vendor daemons

17:00:31 (lmgrd) Shutting down easylicd
17:00:31 (easylicd) daemon shutdown requested - shutting down

Wed Dec 10 17:00:31 1997: ===== closed =====
Wed Dec 10 17:01:38 1997: ===== opened =====
17:01:39 (lmgrd) -----
17:01:39 (lmgrd)   Please Note:
17:01:39 (lmgrd)
17:01:39 (lmgrd)   This log is intended for debug purposes only.
17:01:39 (lmgrd)   There are many details in licensing policies
17:01:39 (lmgrd)   that are not reported in the information logged
17:01:39 (lmgrd)   here, so if you use this log file for any kind
17:01:39 (lmgrd)   of usage reporting you will generally produce
17:01:39 (lmgrd)   incorrect results.
17:01:39 (lmgrd) -----
17:01:39 (lmgrd)

```

```

17:01:39 (lmgrd)
17:01:39 (lmgrd)
17:01:39 (lmgrd) FLEXlm (v5.12a) started on ev1 (Sun) (12/10/1997)
17:01:39 (lmgrd) FLEXlm Copyright 1988-1996, Globetrotter Software, Inc.
17:01:39 (lmgrd) World Wide Web: http://www.globetrotter.com
17:01:39 (lmgrd) License file: "/easydata/license.dat"
17:01:39 (lmgrd) Starting vendor daemons ...
17:01:39 (lmgrd) Started easylicd (internet tcp_port 32810 pid 2336)
17:01:39 (easylicd) Wrong hostid, exiting (expected 8087f687, got 8087f688).
17:01:39 (lmgrd) Please correct problem and restart daemons

17:01:45 (lmgrd) lmgrd will now shut down all the vendor daemons

```

Wed Dec 10 17:01:45 1997: ===== closed =====

## 9.2. SYSTEMMONITOR

Dec 10 17:01:14 1997: === log opened for systemMonitor\_systemMonitor\_ev1  
e (pid 2038) ===

```

Hostname:    ev1
Host id:     8087f688
Version:     EasyVision R4.1
Hospital:    Medisch centrum Best
Department:  crisis centre

```

```

Dec 10 17:01:14 1997: CONNECTION: NOT USING IP ADDRESS FOR HOST[ev1]
Dec 10 17:01:15 1997: SystemMonitor [SetupMonitorService]: stoppping all monitored processes
Dec 10 17:01:15 1997: SystemMonitor [SetupMonitorService]: process [setupDbServer setup] stoppped
Dec 10 17:01:15 1997: Process [setupDbServer] [setup] on host [ev1] : stopped
Dec 10 17:01:21 1997: Process [setupDbServer setup] on host [ev1]: successfully (re)started
Dec 10 17:01:22 1997: SystemMonitor [SetupMonitorService] process [setupDbServer][setup] contacted
Dec 10 17:01:25 1997: SystemMonitor [systemMonitor_ev1]: stoppping all monitored processes
Dec 10 17:01:25 1997: SystemMonitor [systemMonitor_ev1]: process [lmgrd lmgrd_ev1] stoppped
Dec 10 17:01:25 1997: Process [lmgrd] on host [ev1] : stopped
Dec 10 17:01:25 1997: SystemMonitor [systemMonitor_ev1]: process [dbServer db8087f688] stoppped
Dec 10 17:01:25 1997: Process [dbServer] [db8087f688] on host [ev1] : stopped
Dec 10 17:01:26 1997: SystemMonitor [systemMonitor_ev1]: process [uiRF uiRF_ev1] stoppped
Dec 10 17:01:26 1997: Process [uiRF] [uiRF_ev1] on host [ev1] : stopped
Dec 10 17:01:26 1997: SystemMonitor [systemMonitor_ev1]: process [uiSpine uiSpine_ev1] stoppped
Dec 10 17:01:26 1997: Process [uiSpine] [uiSpine_ev1] on host [ev1] : stopped
Dec 10 17:01:27 1997: SystemMonitor [systemMonitor_ev1]: process [uiCardio uiCardio_ev1] stoppped
Dec 10 17:01:27 1997: Process [uiCardio] [uiCardio_ev1] on host [ev1] : stopped
Dec 10 17:01:28 1997: SystemMonitor [systemMonitor_ev1]: process [uiVascular uiVascular_ev1]
stoppped
Dec 10 17:01:28 1997: Process [uiVascular] [uiVascular_ev1] on host [roodkapje] : stopped
Dec 10 17:01:28 1997: SystemMonitor [systemMonitor_ev1]: process [uiStackView uiStackView_ev1]
stoppped
Dec 10 17:01:28 1997: Process [uiStackView] [uiStackView_ev1] on host [roodkapje] : stopped
Dec 10 17:01:29 1997: SystemMonitor [systemMonitor_ev1]: process [uiDental
View uiDentalView_ev1] stoppped
Dec 10 17:01:29 1997: Process [uiDentalView] [uiDentalView_ev1] on host [roodkapje] : stopped
Dec 10 17:01:29 1997: SystemMonitor [systemMonitor_ev1]: process [uiVolume uiVolume_ev1] stoppped
Dec 10 17:01:29 1997: Process [uiVolume] [uiVolume_ev1] on host [ev1] : stopped
Dec 10 17:01:30 1997: SystemMonitor [systemMonitor_ev1]: process [uiMRCardio uiMRCardio_ev1]
stoppped
Dec 10 17:01:30 1997: Process [uiMRCardio] [uiMRCardio_ev1] on host [roodkapje] : stopped
Dec 10 17:01:31 1997: SystemMonitor [systemMonitor_ev1]: process [uiPerfusion uiPerfusion_ev1]
stoppped
Dec 10 17:01:31 1997: Process [uiPerfusion] [uiPerfusion_ev1] on host [roodkapje] : stopped
Dec 10 17:01:31 1997: SystemMonitor [systemMonitor_ev1]: process [xEasyReview xEasyReview_ev1]
stoppped
Dec 10 17:01:31 1997: Process [xEasyReview] [xEasyReview_ev1] on host [roodkapje] : stopped
Dec 10 17:01:32 1997: SystemMonitor [systemMonitor_ev1]: process [uiDataHandling uiDataHandling_ev1]
stoppped
Dec 10 17:01:32 1997: Process [uiDataHandling] [uiDataHandling_ev1] on host [ev1] : stopped
Dec 10 17:01:33 1997: SystemMonitor [systemMonitor_ev1]: process [httpServer http_ev1] stoppped
Dec 10 17:01:33 1997: Process [httpServer] [http_ev1] on host [ev1] : stopped
Dec 10 17:01:33 1997: SystemMonitor [systemMonitor_ev1]: process [networkServer import_ev1] stoppped
Dec 10 17:01:33 1997: Process [networkServer] [import_ev1] on host [roodkapje] : stopped
Dec 10 17:01:34 1997: SystemMonitor [systemMonitor_ev1]: process [networkServer export_ev1] stoppped
Dec 10 17:01:34 1997: Process [networkServer] [export_ev1] on host [roodkapje] : stopped
Dec 10 17:01:34 1997: SystemMonitor [systemMonitor_ev1]: process [hcServer hcs0_ev1] stoppped

```

```

Dec 10 17:01:34 1997: Process [hcServer] [hcs0_ev1] on host [ev1] : stopped
Dec 10 17:01:35 1997: SystemMonitor [systemMonitor_ev1]: process [dorServer dor_ev1] stoppped
Dec 10 17:01:35 1997: Process [dorServer] [dor_ev1] on host [ev1] : stopped
Dec 10 17:01:36 1997: SystemMonitor [systemMonitor_ev1]: process [computeServer compute_ev1]
stoppped
Dec 10 17:01:36 1997: Process [computeServer] [compute_ev1] on host [roodkapje] : stopped
Dec 10 17:01:36 1997: SystemMonitor [systemMonitor_ev1]: process [deleteServer delete_ev1] stoppped
Dec 10 17:01:36 1997: Process [deleteServer] [delete_ev1] on host [ev1] : stopped
Dec 10 17:01:37 1997: SystemMonitor [systemMonitor_ev1]: process [autoExportServer autoExport_ev1]
stoppped
Dec 10 17:01:37 1997: Process [autoExportServer] [autoExport_ev1] on host [ev1] : stopped
Dec 10 17:01:44 1997: Process [lmgrd lmgrd_ev1] on host [ev1]: successfully (re)started
Dec 10 17:01:44 1997: SystemMonitor [systemMonitor_ev1] process [lmgrd] [lmgrd_ev1] contacted
Dec 10 17:01:44 1997: FLEXLM ERROR CHECKOUT:option:EasyServer,version:4.1,mode:Check,error:Cannot
connect to license server (-15,12)
Dec 10 17:01:44 1997: SystemMonitor [systemMonitor_ev1] process [dbServer] [db8087f688] not started
due to missing license(s): exiting complete application
Dec 10 17:01:44 1997: SystemMonitor [systemMonitor_ev1] free: stopping all monitored processes
Dec 10 17:01:44 1997: Process [lmgrd lmgrd_ev1] on host [ev1]: stoppped
Dec 10 17:01:44 1997: Process [lmgrd] on host [ev1] : stopped
Dec 10 17:01:45 1997: Process [setupDbServer setup] on host [ev1]: stoppped
Dec 10 17:01:45 1997: Process [setupDbServer] [setup] on host [ev1] : stopped
Dec 10 17:01:46 1997:      === log closed for systemMonitor_systemMonitor_ev1 (pid 2038) ===

```

### 9.3. INSTALLATION LOGFILE INSTALL.LOG

Welcome to the OS installation utility....

Remember that after an OS installation you have to  
(re)install the application and (re)configure!!!  
type <return> to continue execution

The system will be installed for the EasyVision product

Taking disk c0t3d0 as EasyVision System Disk  
Using "SEAGATE ST32155W SUN2.1G" as disk type.

Taking disk c0t2d0 as EasyVision Image Harddisk  
Using "MICROP 3391NS" as disk type.

WARNING: Add\_Img\_disk (c0t1d0) not detected (skipping)

Formatting takes between 5 and 15 minutes per Gigabyte

Enter your choices now:

Select the required action for the Image Harddisk  
[F(ormat)|P(artition)|S(kip, do not use)]       ?: p

Select the required action for the System Disk  
[F(ormat)|P(artition)]       ?: p

DISK	FORMAT	PARTITION
c0t2d0 (Image Harddisk)	N	Y
c0t3d0 (System Disk)	N	Y

Are these choices correct (Y|N) ? : y

Formatting and/or partitioning selected disks .... DONE.

Now we will install the Operating System software.

This will take about 30 minutes

The next steps are copying some files from CD-ROM to System disk  
But first we have to mount the System disk slices we need....

Mounting and copying will take about 5 minutes....

The file systems /dev/dsk/c0t3d0s0, /dev/dsk/c0t3d0s3,  
/dev/dsk/c0t3d0s6 and /dev/dsk/c0t3d0s7 are mounted now.

```
new owner is root
directory /cdrom/DISK0/spare created
new owner is EasyLook
directory /cdrom/DISK7/EasyLook created
new owner is EasyUser
directory /cdrom/DISK3/adm/cdslog created
new owner is EasyUser
directory /cdrom/DISK3/adm/cdslog/setup created
```

The next step is installing the bootblock in slice /dev/dsk/c0t3d0s0....

The bootblock is installed.

Installing NVRAM settings....  
/cdrom/INSTALL/nvram\_settings.SS5

security-password: data not available.

Creating the mount-points for the Image Harddisk slices  
and creating the correct mount table, both on System disk.

```
new owner is root
directory /cdrom/DISK0/easy created
new owner is root
directory /cdrom/DISK0/easydata created
new owner is root
directory /cdrom/DISK0/dbadmin created
```

The correct mount table is installed.

Updating network information.

Setting the Service password

Creating /cdrom/DISK0/devices

Creating /cdrom/DISK0/dev



---

**Section 5**
**Replacements**


---

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# I M P O R T A N T !!!

## 1. AFTER A HARDWARE MODIFICATION REBOOT WITH: BOOT -R

## 2. SUN ULTRASPARC

### 2.1. MOTHER BOARD

Step	Action	Refer to	Remark
1	Replace the mother board	<u>Manual:</u> UNIT Manual Ultra 5/10 or 60 <u>Section:</u> Replacements <u>Chapter:</u> Mother board and Component replacement	Disconnect all connectors and remove PCI cards, UPA cards, DIMM's, NVRAM, etc.

**Table 1:**

### 2.2. NVRAM

Step	Action	Refer to	Remark
1	Replace NVRAM	<u>Manual:</u> UNIT Manual Ultra 5/10 or 60 <u>Section:</u> Replacements <u>Chapter:</u> Mother board and Component replacement	Replacing the NVRAM (new hostid) will require a new software license file
2	Re-install OS and AS	<u>Manual:</u> Release Bulletin <u>Chapter:</u> Software installation	The correct NVRAM settings for EasyVision will be installed
3	- Reload backup files (if not present in /dbadmin) - Rename: <hostid>.cus file	<u>Manual:</u> Release Bulletin <u>Chapter:</u> Appendix File Transfer	Backup files are: license.dat (License file) config.cfg (Configuration file) <hostid>.cus (Customization file) <host_name>.cal (HCU Calibration file)  Rename: <old_hostid>.cus to <new_hostid>.cus
4	- Adapt EasyVision configuration panel - Execute config	<u>Manual:</u> Release Bulletin <u>Chapter:</u> Configuring <u>Paragraph:</u> Execute the configuration	In EasyVision configuration panel : change hostid to <new_hostid>  <b>Do not change</b> 'image database identification' otherwise the image database will be lost !!!

**Table 2:**

### 2.3. MEMORY

Step	Action	Refer to	Remark
1	Replace the DIMM	<u>Manual</u> : UNIT Manual Ultra 5/10 or 60 <u>Section</u> : Replacements <u>Chapter</u> : Mother board and Component replacement	

**Table 3:**

### 2.4. SYSTEM DISK

Step	Action	Refer to	Remark
1	Remove the system disk	<u>Manual</u> : UNIT Manual Ultra 5/10 or 60 <u>Section</u> : Replacements <u>Chapter</u> : Storage Devices	
2	Replace the system disk	<u>Manual</u> : UNIT Manual Ultra 5/10 or 60 <u>Section</u> : Replacements <u>Chapter</u> : Storage Devices	No jumper settings are required. The SCSI address is related to the backpanel slot.
3	Re-install OS and AS	<u>Manual</u> : Release Bulletin <u>Chapter</u> : Software installation	
4	Reload backup files (if not present in /dbadmin)	<u>Manual</u> : Release Bulletin <u>Chapter</u> : Appendix File Transfer	Backup files are: license.dat (License file) config.cfg (Configuration file) <hostid>.cus (Customization file) <host_name>.cal (HCU Calibration file)
5	Execute config	<u>Manual</u> : Release Bulletin <u>Chapter</u> : Configuring <u>Paragraph</u> : Execute the configuration	

**Table 4:**

## 2.5. CD-ROM

Step	Action	Refer to	Remark
1	Remove the CD-ROM player	<u>Manual:</u> UNIT Manual Ultra 5/10 or 60 <u>Section:</u> Replacements <u>Chapter:</u> Storage Devices	
2	Set jumpers on new CD-ROM player	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Programmings	Ultra 60: SCSI CDROM Ultra 5/10: EIDE CDROM
3	Replace the CD-ROM	<u>Manual:</u> UNIT Manual Ultra 5/10 or 60 <u>Section:</u> Replacements <u>Chapter:</u> Storage Devices	

**Table 5:**

## 2.6. PCI CARDS

Step	Action	Refer to	Remark
1	Remove the PCI card	<u>Manual:</u> UNIT Manual Ultra 5/10 or 60 <u>Section:</u> Replacements <u>Chapter:</u> Mother board and Component replacement	
2	Set jumpers	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Programmings	Not all PCI cards have jumper settings.
3	Replace the PCI card	<u>Manual:</u> UNIT Manual Ultra 5/10 or 60 <u>Section:</u> Replacements <u>Chapter:</u> Mother board and Component replacement	

**Table 6:**

## 2.7. POWER SUPPLY

Step	Action	Refer to	Remark
1	Replace the Power Supply	<u>Manual:</u> UNIT Manual Ultra 5/10 or 60 <u>Section:</u> Replacements <u>Chapter:</u> Major subassemblies / Power Supply	

**Table 7:**

## 2.8. VARIOUS ULTRA 5/10/60 PARTS

Step	Action	Refer to	Remark
1	Remove various Ultra 5/10 or 60 parts	<u>Manual:</u> UNIT Manual Ultra 5/10 or 60 <u>Section:</u> Replacements	
2	Replace various Ultra 5/10 or 60 parts	<u>Manual:</u> UNIT Manual Ultra 5/10 or 60 <u>Section:</u> Replacements	

**Table 8:**

## 3. PERIPHERAL CABINET

### 3.1. IMAGE DISK

For additional image disks see chapter 5 (Image disks).

Step	Action	Refer to	Remark
1	Remove the Image Disk	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Installation <u>Chapter:</u> Peripheral Cabinets	Database will be lost ! Procedure not described. Use your imagination.
2	Set jumpers on new Image Disk	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Programmings	
3	Replace the Image Disk	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Installation <u>Chapter:</u> Peripheral Cabinets	Mount disk in peripheral cabinet.
4	Boot CDROM and Reformat Image Disk	<u>Manual:</u> Release Bulletin <u>Chapter:</u> Installation <u>Paragraph:</u> Software Installation	Format only Image Disk. Choose 2 in OS Install Menu!
6	Execute config	<u>Manual:</u> Release Bulletin <u>Chapter:</u> Configuring ... <u>Paragraph:</u> Execute the configuration	New empty database is created

**Table 9:**

### 3.2. EASYSTORE OPTICAL DISK DRIVE

Step	Action	Refer to	Remark
1	Remove the Storage Drive	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Installation <u>Chapter:</u> Peripheral Cabinets	Procedure not described. Use your imagination.
2	Set jumpers on new Storage Drive	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Programmings	
3	Replace the Storage Drive	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Installation <u>Chapter:</u> Peripheral Cabinets	Mount disk in peripheral cabinet.

**Table 10:**

### 3.3. EASYSTORE RECORDABLE

Step	Action	Refer to	Remark
1	Remove the CD-R Drive	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Installation <u>Chapter:</u> Peripheral Cabinets	Procedure not described. Use your imagination
2	Set jumpers on new CD-R Drive	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Programmings	New CD-R Drive has same SCSI settings as defect CD-R Drive
3	Replace the CD-R Drive	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Replacements <u>Chapter:</u> CD-R Drive	Mount disk in peripheral cabinet

**Table 11:**

### 3.4. POWER SUPPLY

Step	Action	Refer to	Remark
1	Remove all scsi devices from the defective Peripheral cabinet, including scsi cables.	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Installation <u>Chapter:</u> Peripheral Cabinets	Power supply is not a FRU. Replace complete Peripheral Cabinet
2	Replace all devices in new Peripheral Cabinet Re-install scsi cables	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Installation <u>Chapter:</u> Peripheral Cabinets	

**Table 12:**

**4. MONITOR**

Step	Action	Refer to	Remark
1	Replace Monitor		A monitor is a Field Replaceable Unit
2	Adjust Monitor	<u>Manual:</u> System Manual EasyVision <u>Section:</u> Adjustments	Monitor adjustments are done with the Monitor Maintenance Kit

**Table 13:**

## 5. IMAGE DISKS

- Set all jumpers correctly (Manual: System Manual EasyVision, Section: Programmings).
- Mount the disk drive into the Peripheral Cabinet
- Connect SCSI cable + power cable to the drive.
- Close the Peripheral Cabinet, connect SCSI cable, SCSI Terminator and power cable.
- Switch-on the system.
- Interrupt the selftest procedure during the message:

*testing \*\*\*\*\* megs of memory. Still to go....*

by pressing **Stop/A** (at the same time)

The system responds with the ok prompt.

- Put the CD-ROM with the Operating System & Application Software on the tray of the CD-ROM drive, close the door and wait about 5 seconds until the drive is ready.
- Boot from CD\_ROM: ok **boot cdrom**  
The booting procedure takes about 9 minutes. Warning: during reading of the CD-ROM warnings and recoverable errors are shown on the screen. Only when the errors persist for a long time, the CD-ROM may well be damaged and you may need to order another CD-ROM.
- The following entry will be prompted on the screen:

*OS Install Menu:*

*What do you want to do?:*

*1 Install OS*

*2 Reformat disks*

*3 Login as root*

*0 Shutdown*

*Enter the number of your choice: 2*

*Starting*

*Password: **password***

- At the question "Enter your choices now:" answer **P** to partition for the Disk(s). Formatting the disk(s) is not necessary.
- When finished formatting/partitioning you will return to the OS Install Menu. Select: 0 Shutdown
- Eject the CD-ROM and boot normally: ok **boot**
- Select '1. Start Configuration' in Config Menu and enter password.
- Execute the configuration.
- EasyVision will automatically re-boot.

## 6. DOME MD2 FRAMEBUFFER

### 6.1. DOME GREYSCALE BUFFER ULTRA 5/10

To install a DOME GreyScale FRAMEBUFFER in an Ultra 5 or 10 the following procedure must be done:

#### **NOTE**

It is assumed that NO..... PCI PGX(s) or UPA TRUE COLOR (Ultra-10 Only) are installed.

---

Stop the application and shut down the system in a proper way.

Power-ON the system

At memory test of the SUN Press Stop-A

Ok

Type:

```
nvalias md2 pci@1f,0/pci@1/DOME,Md2PCI
nvstore
setenv output-device md2
reset
```

Connect the video cable to the DOME FRAMEBUFFER board. The first FRAMEBUFFER channel always has the DOME logo displayed. Start the configuration and edit the EasyVision "Framebuffer / Monitor settings". Select automatic configuration and leave this panel. Execute the configuration.

If the DOME FRAMEBUFFER is removed and the Onboard frame buffer is used, the next sequence of instructions must be executed:

Stop the application and shut the system down in a proper way.

Power-ON

At memory test of the SUN Press Stop-A

Ok

```
setenv output-device screen
reset
```

Connect the video cable to the Onboard FRAMEBUFFER (the first frame buffer is the first VGA connector, which is located next to the fixating bolt). Start the configuration and edit the EasyVision "Framebuffer / Monitor settings". Select automatic configuration (the PGX onboard frame buffer should be selected) and leave this panel. Execute the configuration.



## 6.2. ULTRA 60

To install a DOME GreyScale FRAMEBUFFER in an Ultra 60 the next procedure must be done:

Stop the application and shut the system down in a proper way.  
Remove the UPA TRUE COLOR FRAME BUFFER(s) and install the DOME GreyScale FRAMEBUFFER.  
Connect the video cable to the DOME frame buffer board. The first frame buffer channel always has the DOME logo displayed (the first frame buffer is the first VGA connector, which is located next to the fixating bolt). Start the configuration and edit the EasyVision "Framebuffer / Monitor settings". Select automatic configuration (the DOME FRAMEBUFFER should be selected) and leave this panel. Execute the configuration.

If the DOME frame buffer is removed and a UPA TRUE COLOR FRAMEBUFFER is used, the next sequence of instructions must be executed:

Stop the application and shut the system down in a proper way.  
Remove the DOME GreyScale FRAMEBUFFER and install the UPA TRUE COLOR FRAMEBUFFER(s).  
Connect the video cable to the UPA TRUE COLOR FRAMEBUFFER. Start the configuration and edit the EasyVision "Framebuffer / Monitor settings". Select automatic configuration and leave this panel. Execute the configuration.

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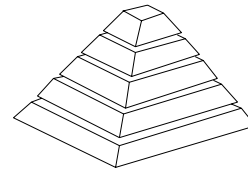
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### 1. GENERAL SCSI DEVICES

#### 1.1. SCSI ADDRESSING

In general all wide SCSI devices have four jumpers to set their SCSI address. In case of narrow SCSI, the devices have three jumpers (ID3 is not available)

SCSI Address	Jumper ID3	Jumper ID2	Jumper ID1	Jumper ID0
0	OUT	OUT	OUT	OUT
1	OUT	OUT	OUT	IN
2	OUT	OUT	IN	OUT
3	OUT	OUT	IN	IN
4	OUT	IN	OUT	OUT
5	OUT	IN	OUT	IN
6	OUT	IN	IN	OUT
7	OUT	IN	IN	IN
8	IN	OUT	OUT	OUT
9	IN	OUT	OUT	IN
A	IN	OUT	IN	OUT
B	IN	OUT	IN	IN
C	IN	IN	OUT	OUT
D	IN	IN	OUT	IN
E	IN	IN	IN	OUT
F	IN	IN	IN	IN

ID3 = Wide SCSI only  
 OUT = jumper not installed  
 IN = jumper installed

## 1.2. SCSI DEVICE NAMES

### Explanation of Device Names:

Example c0t30s0:

c = controller

t = target

d = disc

s = slice (partition)

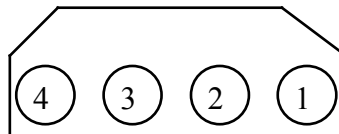
## 1.3. SCSI POWER

All SCSI devices use: +5Vdc and +12Vdc

The DC power connector pinning is shown in the figure below.

### NOTE

*Some devices have the power connector mounted upside down, as shown below.*



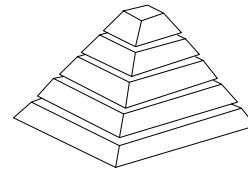
Pin 1: +12V DC  
Pin 2: +12V Return  
Pin 3: +5V Return  
Pin 4: +5V

## 1.4. SCSI BUS TERMINATION

The SCSI bus is terminated with an external SCSI Terminator at the end of the SCSI chain. (see drawings). This means that from all SCSI devices the SCSI terminator (chips) must be removed. For factory delivered systems this has already been done. In case of replacing or adding a (optional) SCSI device you should check if the SCSI termination has been removed!

# Philips Medical Systems

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### 2. PHILIPS CDD 3600 CD-RECORDABLE

#### 2.1. APPLIES TO

EasyVision based on SPARCstation 5, UltraSPARC 1, UltraSPARC 2, Ultra 5, Ultra 10 and Ultra 60 with EVR4.2.x or higher software.

#### 2.2. INTRODUCTION

This sheet describes the installation steps according to the CDD 3600 CD-recordable drive.

#### 2.3. UNPACKING

Unpack the CD-recordable with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.



#### 2.4. INSTALLATION

The CD-recordable drive is installed in the Peripheral 1 Cabinet.

#### WARNING

*Do not mount the CDD 3600 drive in the Peripheral 2 or Peripheral 4 Cabinet!*





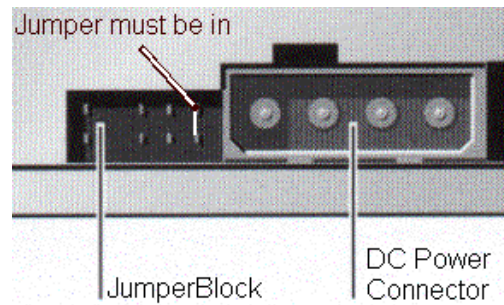
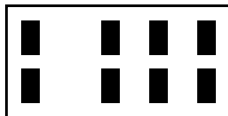
## 2.5. SETTING TO WORK

SCSI address =4.

Remove SCSI terminator.

Jumperblock:

SCSI	ID0	ID1	ID2
Terminator			



## 2.6. OPERATION

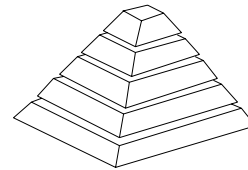
### CAUTION

In writing mode the CD-recordable drive is very sensitive for shock and vibration.  
So be sure that the Peripheral 1 Enclosure is placed in a stable position. If not, it will result in unusable discs and software failures like, system hangups, disc ejection failures, software errors.

---

# Philips Medical Systems

## PMG EVM



### 3. SUN CD32 CDROM

#### 3.1. APPLIES TO

EasyVision based on SS5. UltraSPARC 1, UltraSPARC 2, and UltraSPARC 60.

#### 3.2. INTRODUCTION

This sheet describes the installation steps according to the SUN CDROM drive.

#### 3.3. UNPACKING

Unpack the CD-ROM reader with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.

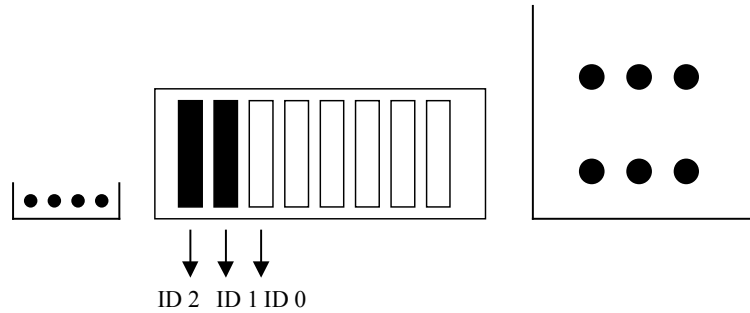


#### 3.4. INSTALLATION

The SUN CDROM drive is factory installed in the SUN station.  
In case of an SS5 and Trolley, the CDROM can be mounted in the PTI 4 cabinet..

### 3.5. SETTING TO WORK

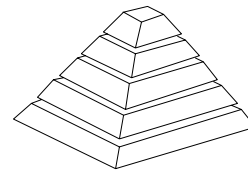
SCSI address =6.



### 3.6. OPERATION

N.A.

# Philips Medical Systems



## PMG EVM

### 4. PIONEER DR-506 CDROM

#### 4.1. APPLIES TO

EasyVision based on SPARCstation 5, UltraSPARC 1, UltraSPARC 2.

#### 4.2. INTRODUCTION

This sheet describes the installation steps according to the Pioneer CDROM drive.

#### 4.3. UNPACKING

Unpack the CD-ROM reader with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.

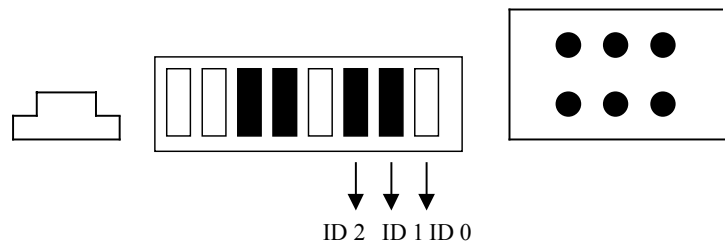


#### 4.4. INSTALLATION

The Pioneer CDROM drive is installed in the SUN Ultra/SS5 station. In case of an SS5 and Trolley, the CDROM can be mounted in the PTI 4 cabinet..

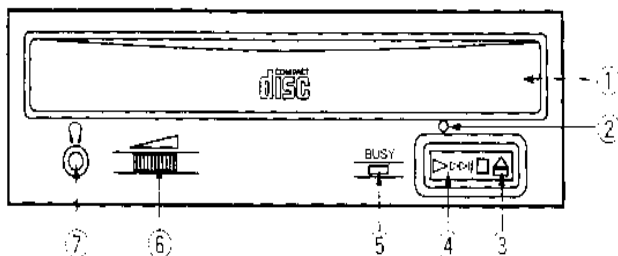
## 4.5. SETTING TO WORK

SCSI address =6.

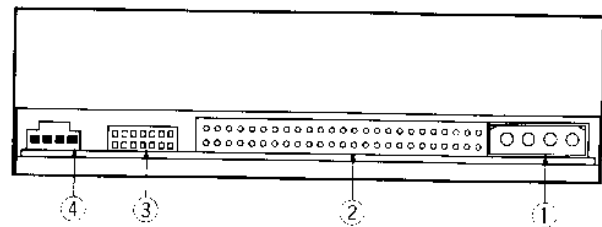


## 4.6. OPERATION

### FRONT VIEW



### REAR VIEW



1. Disc Tray: autoloading is performed with the eject button
2. Hole for Forced Ejection: When the eject button has lost its function, insert a stiff rod into this hole and push to eject the disc tray. Before executing this operation, switch the computer power supply off.
3. Eject/Stop Button: This button is used to move the tray in and out. When this button is pressed once during a playback of an audio disc, the playback will be stopped, and when it is pressed in stopped condition the disc will be ejected.
4. Play/Skip Button: this is used for direct playback of audio discs. When an audio disc is inserted and this button is pressed, play status will be reached, and when this button is pressed in play status, the playback will skip to the next track. Data discs will not be played back.
5. Busy Indicator: This flashes during data access.
6. Volume Control (headphone level): this is used to adjust the volume level of the headphone jack.
7. Headphone Jack: this is a stereo mini-jack for headphones.

1. DC Input: this is the DC input, +5 and +12 volt. Connect the computer power supply only.
2. SCSI Interface: this is a 50-pin I/O connector according to SCSI-2 specifications. Use a flat ribbon SCSI connector to connect to the SCSI host adaptor.
3. Function Switch: use the accessory short-circuit sockets to set the SCSI ID number and the drive function.
4. Audio Output: this is a connector for analog audio output. As a Molex 70553 is used, please select a suitable connection cable.

### Emergency disc retrieval

In the event of a power failure or computer failure, use the following emergency unload procedure to retrieve your disc:

- switch the power off;
- use a straightened paper clip or similar instrument with a narrow tip, insert it straight into the hole for forced ejection and push strongly;
- when the disc tray protrudes sufficiently, pull it out manually;
- retrieve your CD-ROM.

### To re-insert the tray:

- switch the power on;
- either press the Eject/Stop switch or push the disc tray lightly for automatic retraction inside the unit.

### **NOTE**

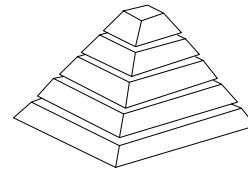
*To avoid damage to the disc tray, neither exert pressure on the extended tray nor place heavy objects on the tray.*

---



# Philips Medical Systems

## PMG EVM



### 5. SUN CREATOR 3D FRAMEBUFFER

#### 5.1. APPLIES TO

EasyVision based on Ultra 10 and Ultra 60.

#### 5.2. INTRODUCTION

This sheet describes the installation steps according to the Creator 3D card.

#### 5.3. UNPACKING

Unpack Creator 3D card with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.



#### 5.4. INSTALLATION

The Creator 3D card is factory installed in the SUN Ultra station

#### 5.5. SETTING TO WORK

No jumper settings

#### 5.6. OPERATION

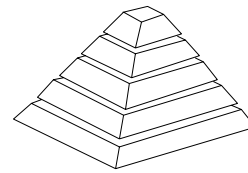
N.A.





# Philips Medical Systems

## PMG EVM



### 6. IBM DDRS 9.1 GB IMAGE DISK

#### 6.1. APPLIES TO

EasyVision based on UltraSPARC 1, UltraSPARC 2, Ultra 5, Ultra 10 and Ultra 60.

#### 6.2. INTRODUCTION

This sheet describes the installation steps according to the IBM DDRS 9.1GB optical disk drives.

#### 6.3. UNPACKING

Unpack the hard disk drive with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.



#### 6.4. INSTALLATION

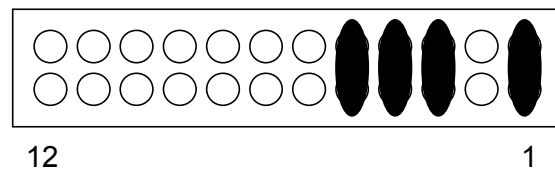
The hard disk drive is factory installed in the Peripheral 2 or Peripheral 4 Cabinet.

## 6.5. SETTING TO WORK

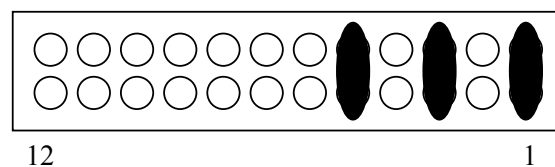


Set the jumper settings of the SCSI.

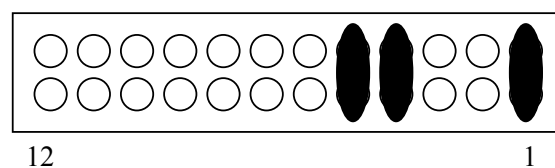
SCSI address =B (11)



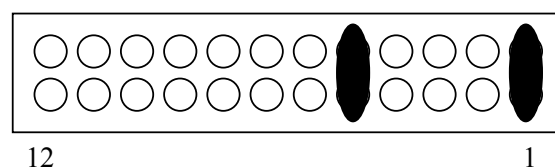
SCSI address =A (10) for 1 additional image disk.



SCSI address =9 for 2 additional image disk.



SCSI address =8 for 3 additional image disk.



### NOTE

Terminator resistors removed

### 6.5.1. DETAILED INFORMATION

In total EasyVision supports 4 IBM DCH disk drives:

DDRS-39130	9.1GB	68 pins SCSI	Single Ended Fast/Wide
------------	-------	--------------	------------------------

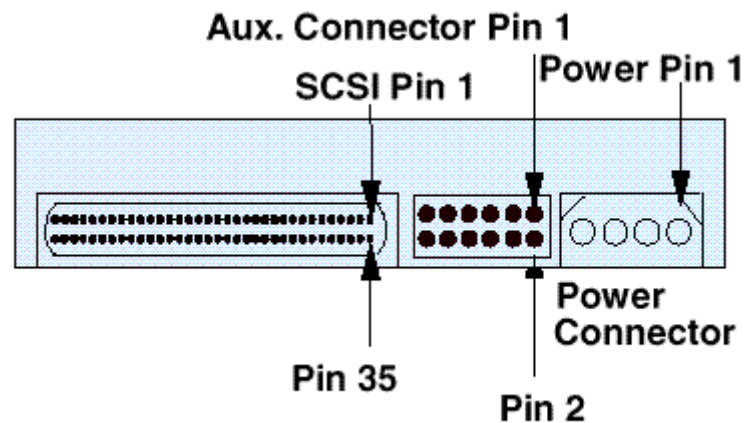


Figure 1 - Single Ended Fast/Wide

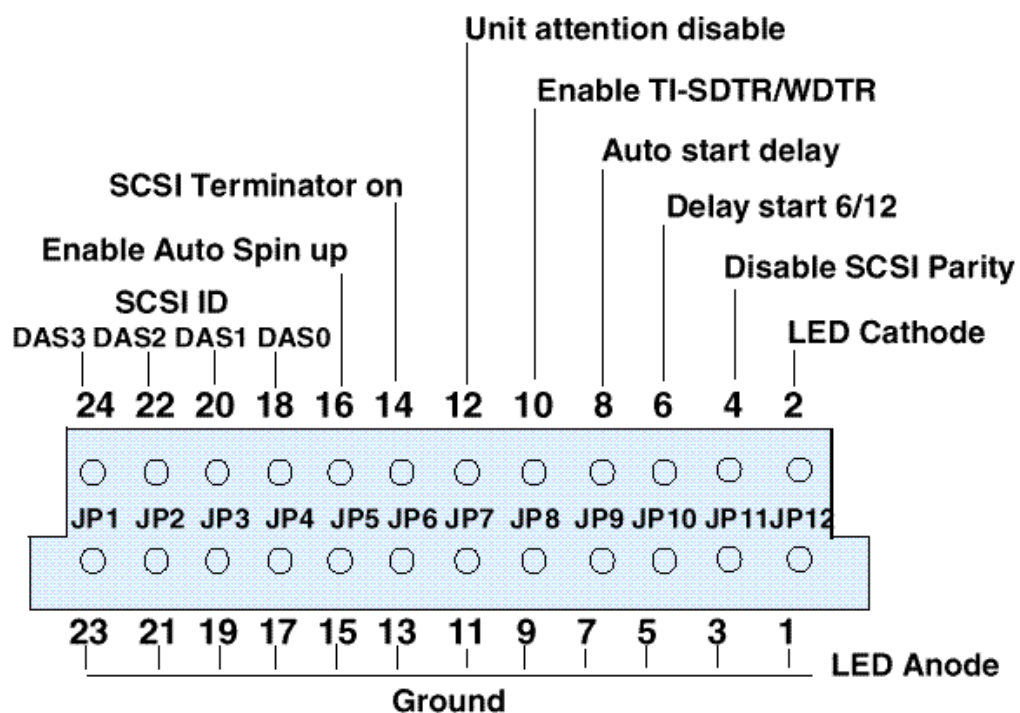


Figure 2 - 68 Pin Model Jumper Pins Assignment (Upside down view)

**Enable Auto Spin Up (JP5)**

This jumper controls how the drive starts when power is applied. If the jumper is installed then the file will spin up automatically after power-on reset. If the jumper is NOT installed the file will NOT spin up unless the host system issues a 'START UNIT' command to the file.

**SCSI Terminator On (JP6)**

When this jumper is installed, the on-card SCSI bus terminator is enabled. No Terminator on 80 pin model.

**Unit Attention Disable (JP7)**

When this jumper is installed the drive will not generate a Unit Attention following a Power On Reset (POR) or SCSI Bus Reset. Any pending Unit Attention conditions will also be cleared at POR or SCSI Bus Reset.

**Enable TI-SDTR/Enable TI-SDTR/WDTR (JP8)**

When the jumper is installed the drive will initiate Synchronous Data transfer speed negotiation (50, 68 and 80 pin) and initiate Wide Data transfer request (68 and 80 pin) following a SCSI bus Reset or power on event.

**Auto Start Delay and Delay Start (JP9, JP10)**

The Auto Start Delay and Delay Start pins control when and how the drive can spin up, with the combination of Auto Spin option (pin #5). When in Auto Spin up and Start Delay mode the drive start will be delayed by a period of time multiplied by its own SCSI address. If Auto Spin up is disabled, these jumpers will be ignored.

Enable Auto Spin up JP5	Auto Start Delay JP9	Delay Start 6/12 JP10	Option
off	don't care	don't care	Drive will NOT spin up Requires Start Command
on	off	off	Spin up immediately after POR
on	on	off	Spin up six seconds multiplied by SCSI address after POR
on	on	on	Spin up twelve seconds multiplied by SCSI address after POR

**Disability SCSI parity (JP11)**

When this jumper is installed, the drive's SCSI parity checking is disabled.

**External Activity (LED) pins (JP12)**

The LED pins can be used to drive an external Light Emitting Diode. Up to 8 mA of sink current capacity is provided. The LED Anode must be tied to the current limited +5V source provided on Pin # 1 of the Option Jumper Block. The LED Cathode is then connected to the Pin # 2 to complete the circuit.

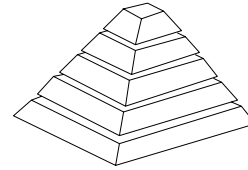
**6.6. OPERATION**

N.A.



# Philips Medical Systems

## PMG EVM



### 7. DOME MD2 PCI FRAMEBUFFER

#### 7.1. APPLIES TO

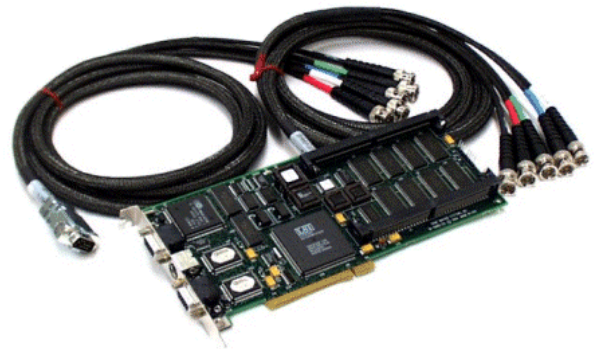
EasyVision based on Ultra 5, Ultra 10 and Ultra 60.

#### 7.2. INTRODUCTION

This sheet describes the installation steps according to the Dome Md2 PCI Framebuffer.

#### 7.3. UNPACKING

Unpack the Md2 PCI Framebuffer with care. Once unpacked, take the proper precautions when handling the device because the card is static sensitive.



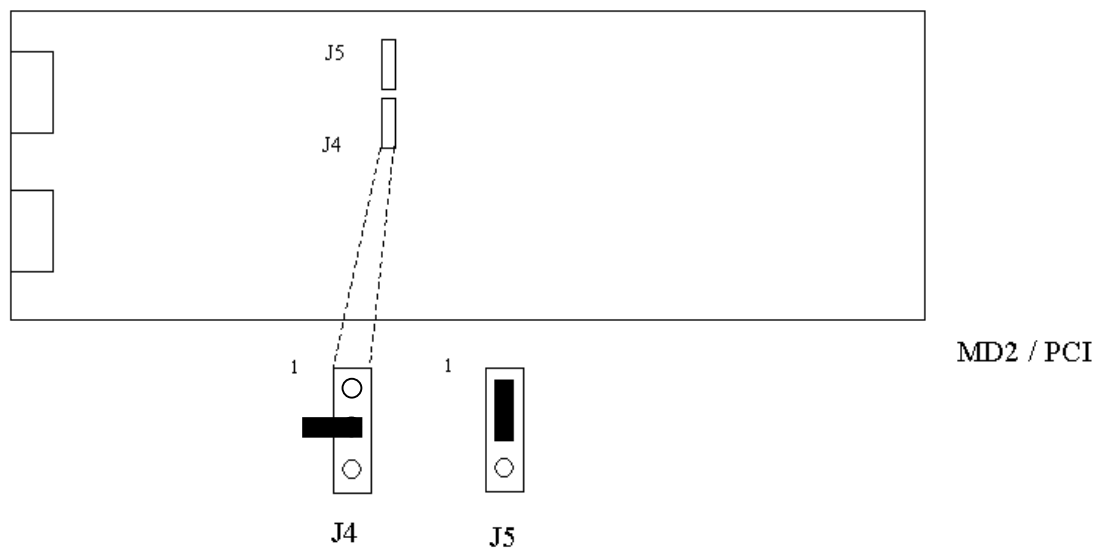
#### 7.4. INSTALLATION

The DOME Md2 PCI card is factory installed in the Ultra station.



## 7.5. SETTING TO WORK

Jumper settings on the card:



J4: Position 2 no jumper connection to pin 1 or 3

J5: Position 1-2 (always)

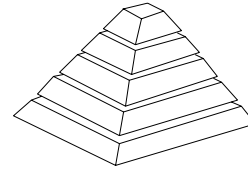
Use only VGA cables with 15 pin sub-D VGA connectors at both ends; cables with BNC connectors will not work with FIMI monitors.

## 7.6. OPERATION

N.A.

# Philips Medical Systems

## PMG EVM



### 8. HARDCOPY UNIT PCI CARD

#### 8.1. APPLIES TO

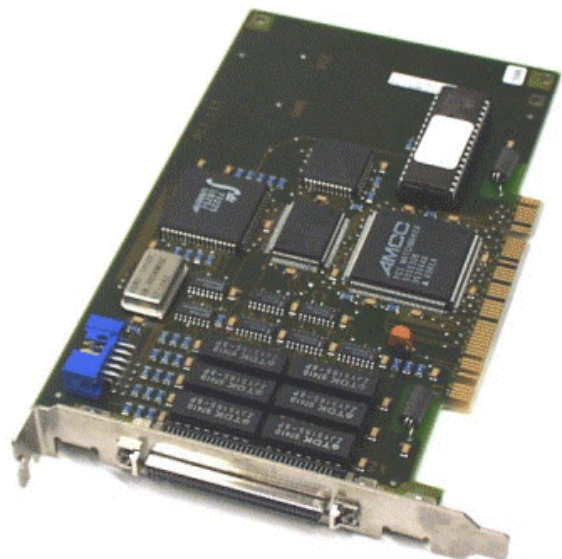
EasyVision based on Ultra 5, Ultra 10 and Ultra 60.

#### 8.2. INTRODUCTION

This sheet describes the installation steps according to the HCU SCSI Card.

#### 8.3. UNPACKING

Unpack the HCU SCSI card with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.



#### 8.4. INSTALLATION

The HCU SCSI card is factory installed in the SUN Ultra Station.

In case of an option:

1. For EasyVision Release 4 Furniture version, unmount the SUN
2. Unpack the SCSI control card, the short (external) cable and the SCSI Adaptor Differential. Ensure that the mains power supply to the EasyVision system has been switched off.
3. Remove the cover of the EasyVision according the EasyVision SUN Ultra Unit Manual, Chapter Internal Access
4. Install the SCSI HCU card
5. No jumper settings to be set

### **8.5. SETTING TO WORK**

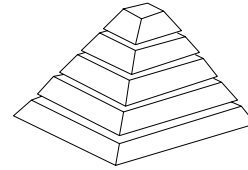
No jumper settings to be installed

### **8.6. OPERATION**

For the HCU operation, see Service Manual Imager/Printer Compatibility.

# Philips Medical Systems

## PMG EVM



### 9. PCI (DMS) READER CARD

#### 9.1. APPLIES TO

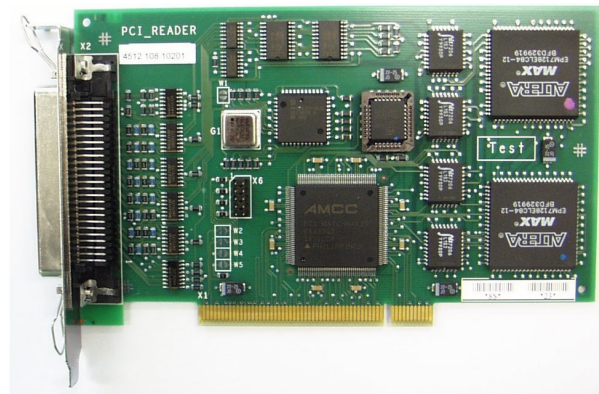
EasyVision RAD based on Ultra 5, Ultra 10 and Ultra 60.

#### 9.2. INTRODUCTION

This sheet describes the installation steps according to the PCI (DMS) Reader card.

#### 9.3. UNPACKING

Unpack the PCI (DMS) Reader card with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.



#### 9.4. INSTALLATION

The PCI (DMS) Reader card is factory installed in the SUN Ultra station.

##### In case of upgrading to the DMS reader option:

1. Unpack the PCI (DMS) Reader card and the DMS Reader cable. Ensure that the mains power supply to the EasyVision system has been switched off.
2. Remove the cover of the EasyVision according to the EasyVision SUN Ultra Unit Manual, Chapter Internal Access.
3. Insert the PCI (DMS) Reader card into a suitable PCI slot and reassemble the computer
4. Connect the DMS cable between the SUN and the Reader DMS connector.
5. Power up the Sun Ultra5/ 10/ 60 press STOP-A and enter at the OK prompt **boot -R.**
6. At the Start up Menu select Configuration go to the EasyVision RAD edit mode click on Peripheral Settings and activate DMS Reader ☒ Present. Click on Exit, proceed, Execute the configuration confirm and start the application.

## **9.5. SETTING TO WORK**

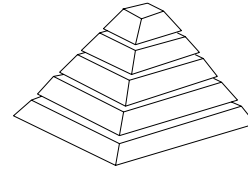
There are no DIP switches and jumpers to be set.

## **9.6. OPERATION**

For the reader operation, see section 2, Installation, cabling IP 'Readers with parallel interface'

# Philips Medical Systems

## PMG EVM



### 10. SUN PGX FRAMEBUFFER

#### 10.1. APPLIES TO

EasyVision based on Ultra 5 and Ultra 10.

#### 10.2. INTRODUCTION

This sheet describes the installation steps according to the PGX card.

#### 10.3. UNPACKING

Unpack the PGX card with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.



#### 10.4. INSTALLATION

The PGX card is factory installed in the SUN Ultra station.

In case of an option:

1. For EasyVision Release 4 Furniture version, unmount the SUN
2. Unpack the SCSI control card, the short (external) cable and the SCSI Adaptor Differential. Ensure that the mains power supply to the EasyVision system has been switched off.
3. Remove the cover of the EasyVision according the EasyVision SUN Ultra Unit Manual, Chapter Internal Access
4. Set jumper settings
5. Install the PGX card
6. Mount the SUN Ultra station into the trolley

PGX



## 10.5. SETTING TO WORK

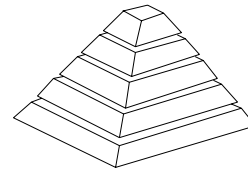
For jumper settings, see chapter Installation

## 10.6. OPERATION

N.A.

# Philips Medical Systems

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### 11. PIONEER DE-UH 7107 EASYSTORE

#### 11.1. APPLIES TO

EasyVision based on SPARCstation 5, UltraSPARC 1, UltraSPARC 2, Ultra 5, Ultra 10 and Ultra 60.

#### 11.2. INTRODUCTION

This sheet describes the installation steps according to the Pioneer DE-UH 7107 optical disk drives.

#### 11.3. UNPACKING

Unpack the optical disk drive with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.



#### 11.4. INSTALLATION

The optical disk drive will be delivered in the Peripheral 2 or Peripheral 4 Cabinet.

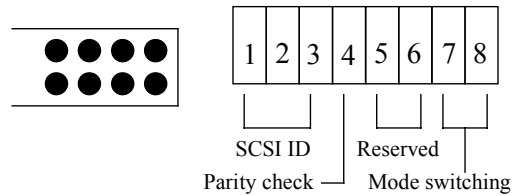
- In case of an upgrade: when the optical disk drive has been installed and attached to the SCSI bus the operating system and application software has to be reinstalled to incorporate the OD in the system.
- After the complete software has been installed start the configuration tool. Edit the EasyVision (EVn) configuration. In the configuration screen click on **Peripheral Settings**. At the top of the screen Peripheral Settings highlight **Storage Drive** ⇒ **Present** and click on Exit. In the entry field **Storage drive name** enter Storage drive on EVn. On the EasyVision configuration screen click on **proceed** and for the configuration click on **Execute** and confirm.  
When the application has been started the storage drive is available.

Note: Make sure that the EasyStore option has been purchased and the License file has been updated before you start upgrading.



## 11.5. SETTING TO WORK

Jumperblock:

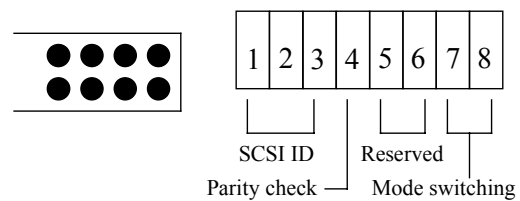


### 11.5.1. SS5 SETTINGS

Set the jumper settings of the SCSI address.

SCSI address =0.

Terminators resistors removed

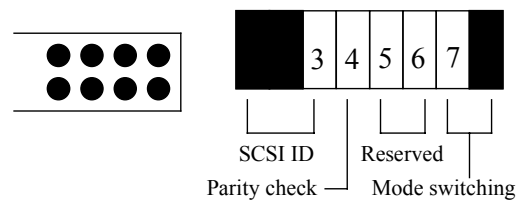


### 11.5.2. ULTRA SETTINGS

Set the jumper settings of the SCSI address.

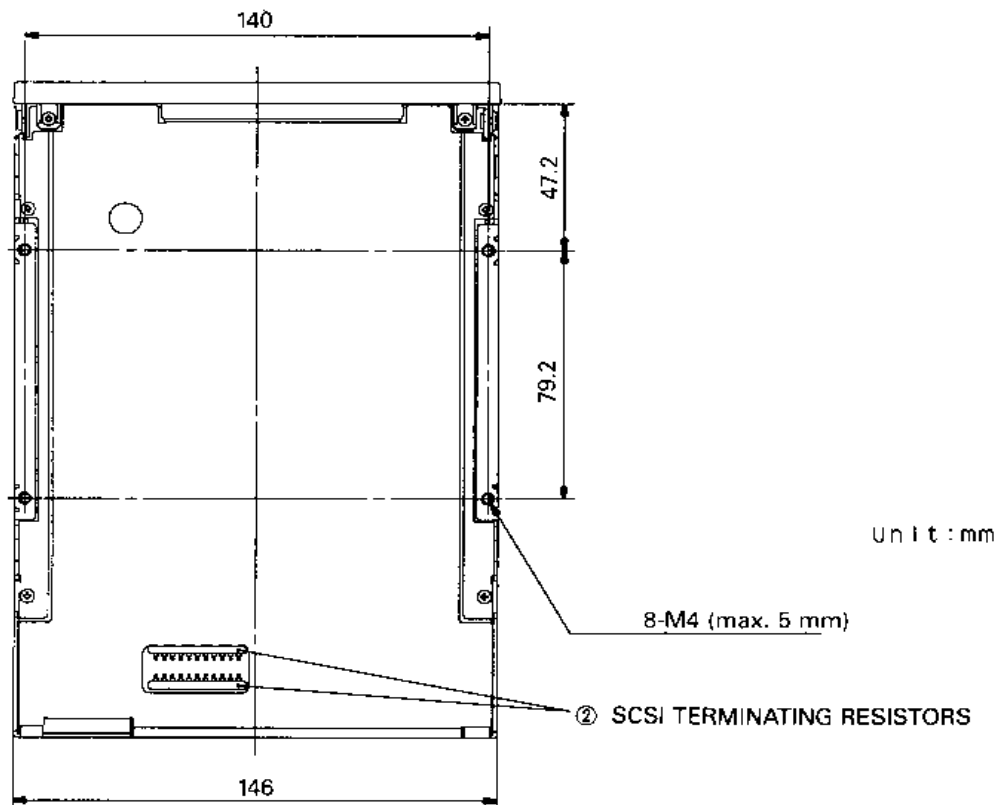
SCSI address =3.

Terminators resistors removed

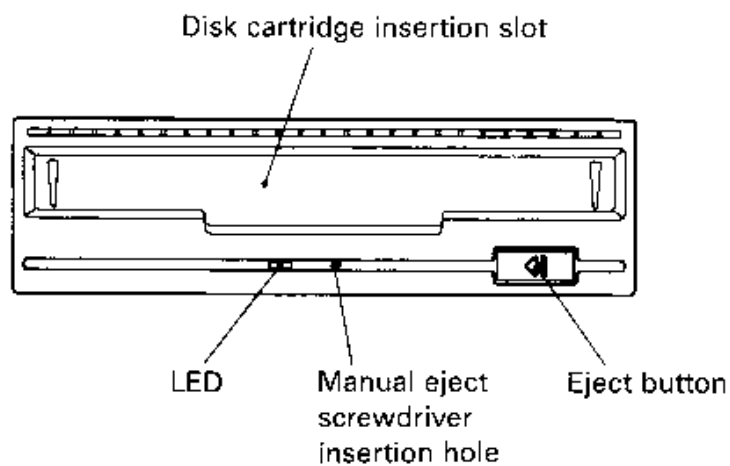


### 11.5.3. DETAILED INFORMATION

### 11.5.4. TERMINATORS



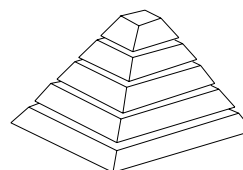
### 11.6. OPERATION





# Philips Medical Systems

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### 12. SUN QUAD ETHERNET CONTROLLER 10/100MBIT

#### 12.1. APPLIES TO

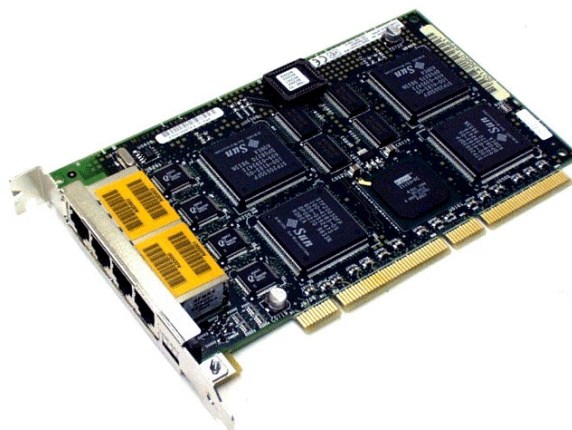
EasyVision based on Ultra 5, Ultra 10 and Ultra 60.

#### 12.2. INTRODUCTION

This sheet describes the installation steps according to the Quad ethernet controller 10/100Mbit (SUN).

#### 12.3. UNPACKING

Unpack the Quad ethernet controller 10/100Mbit (SUN) with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.



#### 12.4. INSTALLATION

The Quad ethernet controller 10/100Mbit (SUN) is factory installed in the Ultra. (No jumper settings)

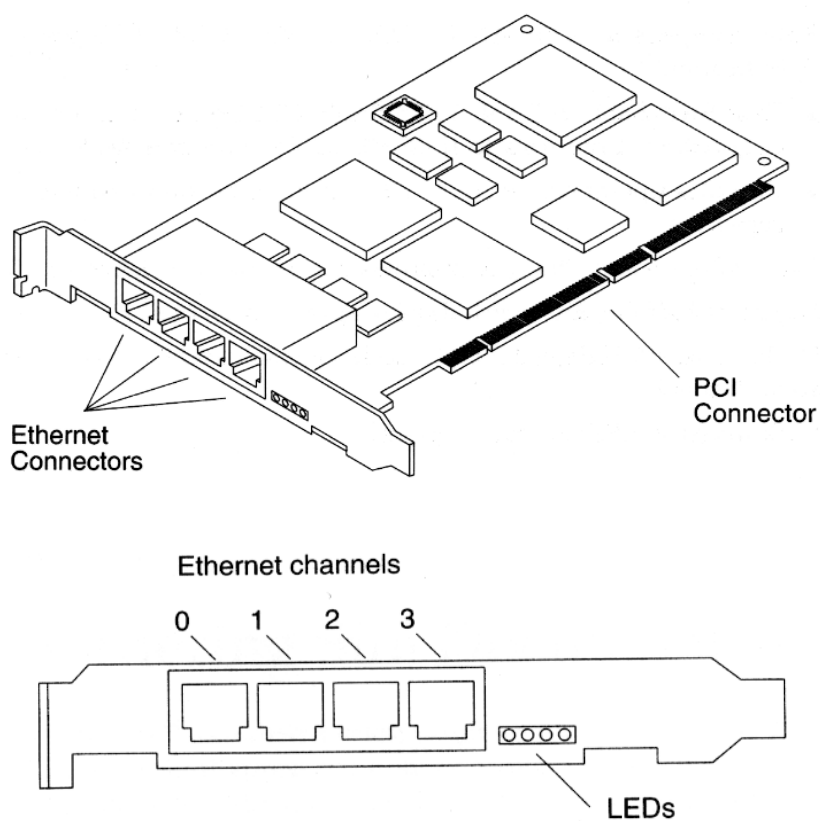
In case of an option:

1.	Power off your system and open the system unit.
2.	Attach the adhesive copper strip of the wrist strap to the metal casing of the power supply. Wrap the other end twice around wrist, with the adhesive side against your skin.
3.	Holding the PCI adapter by the edges, unpack and place it on an antistatic surface
4.	Remove the PCI filler panel from the slot in which you want to insert the Sun Quad FastEthernet PCI adapter.
5.	Holding the PCI adapter by the edges, align the adapter edge connector with the PCI slot. Slide the adapter face plate into the small slot at the end of the PCI opening.
6.	Applying even pressure at both corners of the adapter, push the PCI adapter until it is firmly seated in the slot.
7.	If necessary, reinstall the PCI filler panel in the unused PCI opening.
8.	Detach the wrist strap and close the system unit.
9.	Connect the Ethernet cables to the SUN Quad FastEthernet PCI adapter and to an Ethernet network. Empty Ethernet channels need a Ethernet loopback connector to avoid network connection errors.

## 12.5. SETTING TO WORK

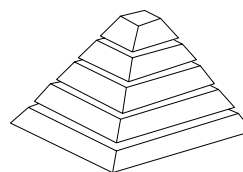
1.	Power on the system, and when the banner appears, press the Stop-A keys to interrupt the boot process and to get the <code>ok</code> prompt.
2.	Use the <code>show-devs</code> command to list the system devices. You should see lines in the list of devices, similar to the example below:
	<pre> Ok show-devs ... /pci@1f,2000/pci@2/SUNW,qfe@0,1 /pci@1f,2000/pci@2/SUNW,qfe@1,1 /pci@1f,2000/pci@2/SUNW,qfe@2,1 /pci@1f,2000/pci@2/SUNW,qfe@3,1 ... </pre>

## 12.6. OPERATION



# Philips Medical Systems

## PMG EVM



### 13. SUN FASTETHERNET PCI ADAPTER

#### 13.1. APPLIES TO

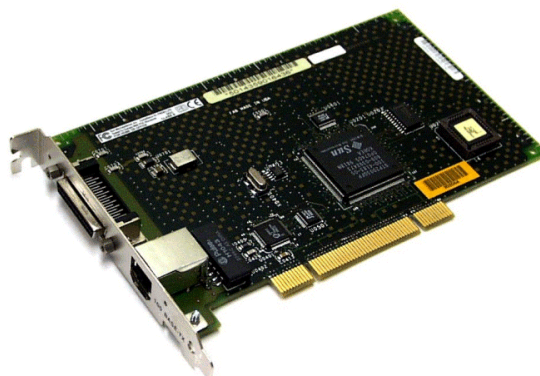
EasyVision based on Ultra 5, Ultra 10 and Ultra 60.

#### 13.2. INTRODUCTION

This sheet describes the installation steps according to the SUN FastEthernet PCI Adapter.

#### 13.3. UNPACKING

Unpack the SUN FastEthernet PCI Adapter with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.



#### 13.4. INSTALLATION

The SUN<sup>TM</sup> FastEthernet<sup>TM</sup> PCI Adapter is factory installed in the Ultra. (No jumper settings)

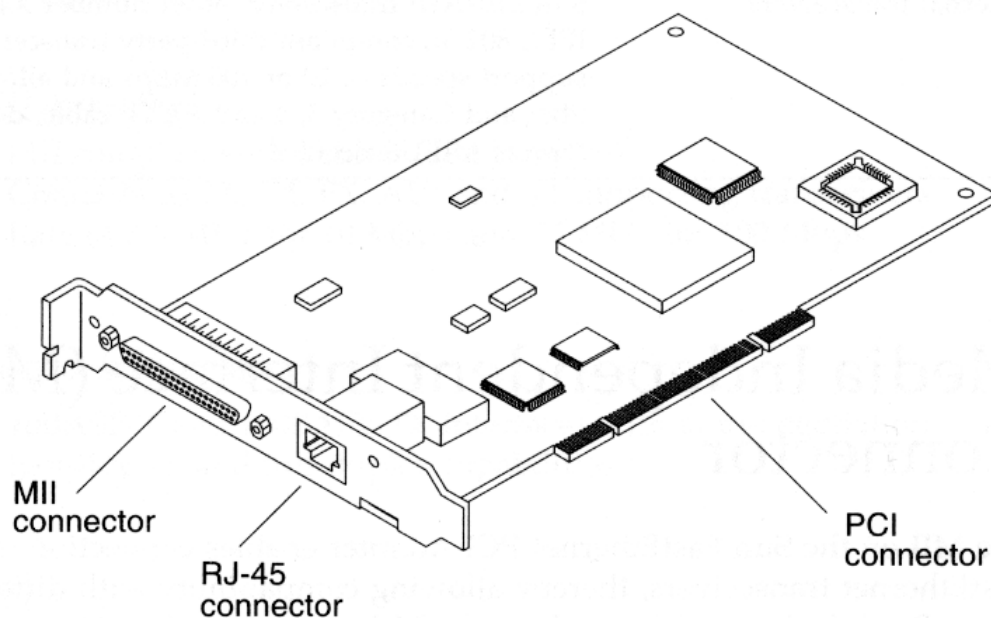
In case of an option:

1.	Power off your system and open the system unit.
2.	Attach the adhesive copper strip of the wrist strap to the metal casing of the power supply. Wrap the other end twice around wrist around wrist, with the adhesive side against your skin.
3.	Holding the PCI adapter by the edges, unpack and place it on an antistatic surface
4.	Remove the PCI filler panel from the slot in which you want to insert SUN <sup>TM</sup> FastEthernet <sup>TM</sup> PCI Adapter.
5.	Holding the PCI adapter by the edges, align the adapter edge connector with the PCI slot. Slide the adapter face plate into the small slot at the end of the PCI opening.
6.	Applying even pressure at both corners of the adapter, push the PCI adapter until it is firmly seated in the slot.
7.	If necessary, reinstall the PCI filler panel in the unused PCI opening.
8.	Detach the wrist strap and close the system unit.
9.	Connect the Ethernet cable to the SUN <sup>TM</sup> FastEthernet <sup>TM</sup> PCI adapter and to an Ethernet network.

### 13.5. SETTING TO WORK

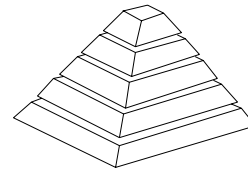
1.	Power on the system, and when the banner appears, press the Stop-A keys to interrupt the boot process and to get the <code>ok</code> prompt.
2.	Use the <code>show-devs</code> command to list the system devices. You should see lines in the list of devices, similar to the example below:
	<pre>Ok show-devs ... /pci@1f,4000/SUNW,hme@4,1 ...</pre>

### 13.6. OPERATION



# Philips Medical Systems

## PMG EVM



### 14. SONY SMO-F541 CT/MR INPUT DRIVE

#### 14.1. APPLIES TO

EasyVision based on SPARCstation 5, UltraSPARC 1, UltraSPARC 2, Ultra 5, Ultra 10 and Ultra 60.

#### 14.2. INTRODUCTION

This sheet describes the installation steps according to the Sony SMO-F541 optical disk drives.

#### 14.3. UNPACKING

Unpack the optical disk drive with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.



#### 14.4. INSTALLATION

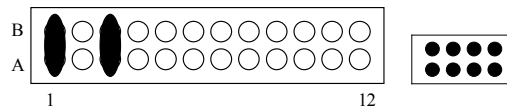
The optical disk drive is factory installed in the Peripheral 2/4 Enclosure.



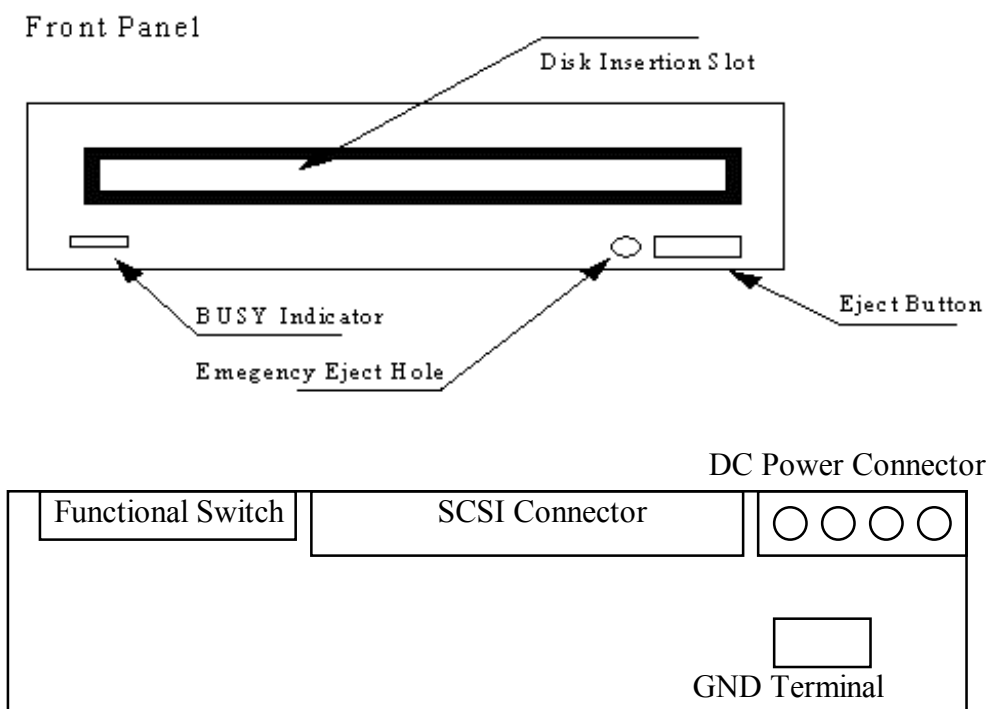
## 14.5. SETTING TO WORK

SCSI address =5

Terminators resistors removed



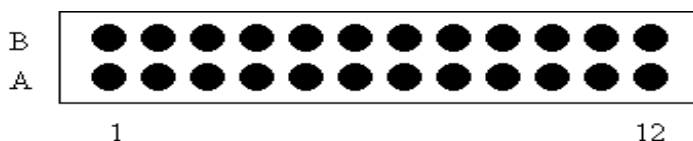
## 14.6. OPERATION



- Functional Switch:** A 24 pin header socket jumper block is used for setting the SCSI drive number and other drive configurations.
- SCSI Connector:** A standard 50-pin SCSI connector is used for connection with the host system.
- DC Power Connector:** A 4-pin DC voltage, power supply connector.
- GND Terminal:** The drive's ground outlet.
- Disk Insertion Slot:** Insert the disk cartridge into this slot.
- BUSY Indicator:** The indicator lights up when the drive is accessing or writing data. Do not eject the disk cartridge when this indicator is lit.
- Emergency Eject Hole:** If the disk cartridge can not be ejected using the eject button or SCSI command, turn off power and insert the supplied emergency eject tool into this hole to eject turn off power and insert the supplied emergency eject tool into this hole to eject the cartridge.
- Eject Button:** Press this button to eject the disk cartridge from the drive. This eject button is disabled when the functional switch or software settings prohibit ejection.

### 14.6.1. DETAILED INFORMATION

#### Jumper block:



A1	SCSI ID2	B1	GND
A2	SCSI ID1	B2	GND
A3	SCSI ID0	B3	GND
A4	SCSI Parity	B4	GND
A5	Write Cache Control	B5	Reserved
A6	Disable Auto Spin-up	B6	Reserved
A7	Force Verify for Write Operation	B7	Reserved
A8	Reserved	B8	Reserved
A9	Disable Manual Eject	B9	Reserved
A10	Reserved	B10	Reserved
A11	Enable Termination	B11	GND
A12	Terminator Power	B12	Terminator Power Source

#### **SCSI ID2, 1, 0:**

These connector pins are used for setting the SCSI ID.

#### **SCSI Parity:**

If no jumper socket is placed into this switch, the drive performs SCSI parity checking (factory default). If a jumper socket is placed to this switch, the drive does not perform SCSI parity checking.

#### **Write Cache Control:**

In no jumper is placed into this switch, the drive performs write back caching (factory default). If a jumper socket is placed to this switch, the drive does not perform write back caching.

#### **Disable Auto Spin-up:**

This function switch, controls drive automatic spin-up mode. If no jumper socket is placed into this switch, the drive automatically spins up media when it is loaded (factory default). If a jumper socket is place to this switch, this function is disabled.

#### **Force Verify for Write Operation:**

If a jumper socket is placed to this switch the drive performs write and verify operation when it executes WRITE command.

#### **Disable Manual Eject:**

This function switch informs the drive whether it enables or disables cartridge ejection by the eject button. The settings are Enable = OFF (Factory Default) and Disable =ON

#### **Enable Termination:**

This function switch informs the drive whether it enables or disables internal SCSI active terminator. The settings are Enable = ON and Disable = OFF (Factory Default)

#### **Terminator Power:**

This line is connected to the SCSI bus TERMPWR line.

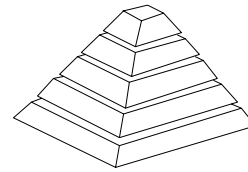
#### **Terminator Power Source:**

This line supplies +5V DC through an isolation diode for SCSI terminator power to: the SCSI bus TERMPWR line. Connecting pin A12 to B12 enables the SCSI TERMPWR signal.



# Philips Medical Systems

## PMG EVM



### 15. SUN TWIN SCSI PCI CARD

#### 15.1. APPLIES TO

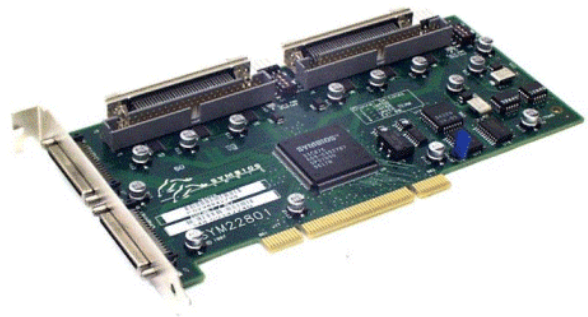
EasyVision based on Ultra 5, Ultra 10 and Ultra 60.

#### 15.2. INTRODUCTION

This sheet describes the installation steps according to the PCI Twin SCSI card.

#### 15.3. UNPACKING

Unpack the PCI Twin SCSI card with care. Once unpacked, take the proper precautions when handling the device because the drive is static sensitive.



## 15.4. INSTALLATION

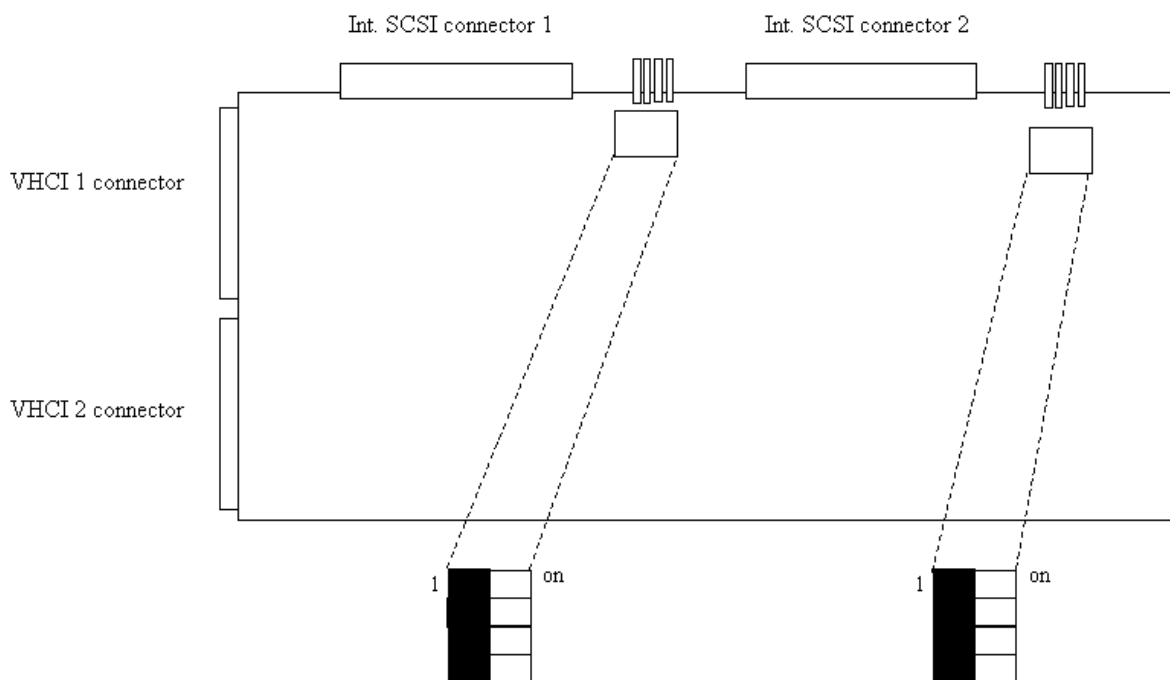
The PCI Twin SCSI card is factory installed in the Ultra. (No jumper settings)

In case of an option:

1.	Power off your system and open the system unit.
2.	Attach the adhesive copper strip of the wrist strap to the metal casing of the power supply. Wrap the other end twice around wrist around wrist, with the adhesive side against your skin.
3.	Holding the PCI adapter by the edges, unpack and place it on an antistatic surface
4.	Remove the PCI filler panel from the slot in which you want to insert PCI Twin SCSI card.
5.	Install jumpers, see Setting to work
6.	Holding the PCI card by the edges, align the card edge connector with the PCI slot. Slide the adapter face plate into the small slot at the end of the PCI opening.
7.	Applying even pressure at both corners of the card, push the PCI card until it is firmly seated in the slot.
8.	If necessary, reinstall the PCI filler panel in the unused PCI opening.
9.	Connect the SCSI cables.

## 15.5. SETTING TO WORK

Jumper settings:



## 15.6. OPERATION

N.A.

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Section 7

Adjustments

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## 1. MONITOR CALIBRATION

There are two different menu locations. One is in the monitor menu which displays patterns. The other one is in the Workspace menu (Open windows) and is used to calibrate the Brightness uniformity and Convergence for Color monitors.

For the specific monitor procedures see the Monitor Service Manual.

### 1.1. MONITOR TEST PATTERNS

To access the monitor menu environment select entry number 4 (Go to Service Menu) in the StartUp menu. Then at the **password:** prompt enter **password**

Service Menu

=====

1. Diagnostics Menu (sunvts and product diagnostics)
2. Sun Os Menu (optical disk format and Sun Os commands)
3. File Menu (file transfer and manipulation commands)
4. Printer Menu (printer tests)
5. Monitor Menu (Monitor test images and adjustment)

0 Logout

Enter the number of your choice: 5

Monitor Menu

=====

1 Start Monitor Color Map Test

0 Return to Service Menu

Enter the number of your choice: 1

The following test patterns are shown in sequence by following the instructions on the screen:

- GreyScale / Color scale pattern
- Color scale / GreyScale pattern
- Crosshatch / circle
- Resolution
- 25% White  
To verify the brightness value setting. Refer to the monitor manual for the specific value.
- Black screen  
To verify the black level setting of the monitor, which is always 1 Cd/m2.
- All mixed



## 1.2. COLOR MONITOR CALIBRATION

There is special monitor software to adjust the color monitor brightness uniformity and convergency. This software can only operate in the open windows environment and requires the monitor calibration tool. The procedure is as follows:

### NOTE

*Due to a hardware problem in the SUN systems the serial port does not always recognize the monitor calibration tool. For this reason it may be necessary to boot the system with the monitor calibration tool connected.*

---

Start-up menu:

- 1 Start Application
- 2 Start Customization
- 3 Goto Service menu
- 4 Go to Installation / Configuration menu
- 0 Shut down

- Select number 3: Service Menu.

#### Service Menu:

- 1 Diagnostics Menu (sunvts and product diagnostics).
- 2 SunOS Menu (optical disk format and SunOS commands).
- 3 File menu (File transfer and manipulation commands).
- 4 Printer menu (Printer tests).
- 5 Monitor menu (Monitor test images and adjustments).
- 0 Logout

- Select number 2: SunOs Menu

SunOs Menu  
=====

- 1. Optical Disk Format Menu.
- 2. Sun Os: a C-shell is started in the service directory.  
Type 'exit' to return to this menu.
- 3. SunOS: OpenWindows is started in the service-directory  
Use 'Exit...' in the workspace pop-up menu to return to this menu
- 0 Return to the service menu

- Select number 3: SunOS: OpenWindows

Move the cursor to the canvas (background) and click the right mouse button. Select in this Workspace menu the Color monitor adjustment entry.

The Cyberscreen Color Monitor Maintenance Software is started. Refer to the color monitor documentation for the adjustment procedure.

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**Section 8**

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**Explanations**

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## 1. UNIX, THE OPERATING SYSTEM

### 1.1. INTRODUCTION

#### Scope

This chapter describes the basic elements of the UNIX operating system.

#### Objectives

After studying this chapter, the Philips service engineer has some knowledge of:  
how the operating system is organized  
the different possibilities in UNIX and is able to:

- manipulate files, directories and devices
- maintain the file system

#### Prerequisites

In order to understand this chapter the following topics have to be covered:

- Introduction to operating systems
- VAX/VMS or MS-DOS

Multi-users systems

### 1.2. UNIX OPERATING SYSTEM HISTORY

Designed in 1969, the UNIX system was originally developed for medium-sized minicomputers (DEC PDP series) by Bell Laboratories and later moved to large, powerful mainframe computers as well as microcomputers. Bell Laboratories has consistently introduced new versions of UNIX every few years. There are consequently, many versions of UNIX. Also under the great influence of AT&T, the operating system was further developed to a so called System V. It is a C-based operating system (Bourne shell).

The university of California at Berkeley introduced a variation of the standard system: the Berkeley Software Distribution (BSD) Version 4.2 using C shell which is a more extended system.

The UNIX version used in SUNOS 4.1 operating system is a heavily enhanced version of the 4.2 and 4.3 BSD UNIX system. It also includes features of AT&T, system V.3 UNIX.

To arrive at a more standardized version of UNIX Sun introduced, in 1993, a new Operating System called "Solaris". Solaris (= SunOS 5.x) is based on the industry standard: UNIX System V Release 4 (SVR4).

Solaris is a total system-software solution, integrating the following:

- OPEN LOOK Window Manager and DeskSet
- Open Windows developer environment

Standardized network protocols.

### 1.3. UNIX OPERATING SYSTEM FEATURES

The UNIX operating system has the following important features:

**Multitasking capability.**

Offers the computer the ability to perform several tasks simultaneously. Background tasks are those that can be executed without user's intervention.

Foreground tasks requires user's intervention.

**Multi-user capability.**

Permits several users to use the same computer simultaneously. More than one user can access the same data at the same time.

**Transportability.**

Is easier to modify the UNIX system code for installation on a new computer than to rewrite another operating system. More than 90% of the kernel program (explanation follows) is written in C and the rest in machine-specific language. At worst, only 10% of the kernel program must be rewritten to move the kernel to an entirely new machine architecture.

Large selection of powerful UNIX-supplied programs can be divided into two classes:

1. Integral utilities: Parts of the UNIX system that provide such assistance to the operating system that are absolutely necessary for the practical operation of a computer with UNIX. An example is the UNIX system command interpreter, the SHELL program;
2. Tools: Application programs that are not necessary to the computer's basic operation. An example is the word processing "vi".

**Communication and electronic mail**

Includes the following options:

1. Communicating between different terminals hooked into the same computer
2. Communicating between different computers

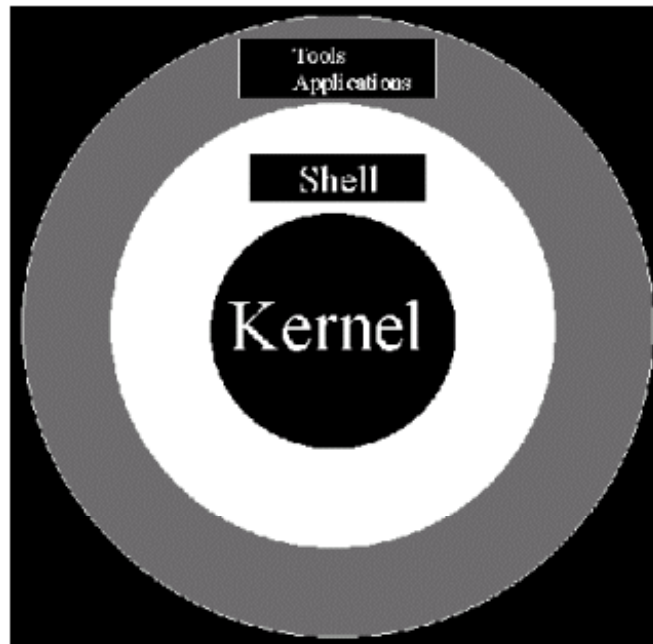
Library of applications software.

A library of over 500 UNIX applications programs has been developed.

## 1.4. UNIX OPERATING SYSTEM STRUCTURE

The UNIX system's parts may be functionally categorized into three levels:

- the KERNEL
- the SHELL
- the tools and applications



**UNIX operating structure**

### 1.4.1. KERNEL

The kernel is the heart of the operating system, controlling the hardware and actually turning parts of the computer system on and off at program's commands.

The kernel manages all the physical resources. Kernel functions include:

- implements the file system and permits processes to create, read, write, and remove these files
- schedules the tasks, keeps track of all active processes and decides which gets to run next
- manages the device drivers, software routines which control physical devices such as graphics display, mouse, keyboard, disk, tape, serial ports and Ethernet
- supports facilities for creating, examining, and modifying processes
- performs system management functions, such as halting, booting, and error handling
- performs miscellaneous functions which make resources like memory available to processes

The file system, which resides on the disk and provides an organization for all the UNIX system data, is also considered a resource and is managed directly by the kernel. The kernel program resides on the disk in a single file, typically known as vmunix.

### **1.4.2. SHELL**

The shell is a program that connects and interprets the commands typed by a user. It interprets user requests, calls programs from memory, and executes them one at a time or in a series.

The shell program translates the typed commands into commands that the kernel understands.

The C shell (csh), with a C-like syntax, has more useful features for interactive use, such as command aliasing, job control, and a history mechanism.

The Bourne shell (sh), the standard UNIX system command interpreter, while providing fewer interactive features, runs faster and has a simpler syntax for writing shell programs.

### **1.4.3. TOOLS & APPLICATIONS**

The tools and applications level adds special capabilities to the operating system.

Either the CPU is executing the kernel program, a shell program, or another command program. Unix is a time-sharing system.

## **1.5. THE OPERATING SYSTEM**

### **1.5.1. USER INTERFACE**

UNIX uses a three level user interface:

- line orientated
- ASCII full-screen orientated
- X Windows System environment

### 1.5.2. LOGGING IN & OUT

After pressing RETURN on a terminal which is properly set up, a UNIX system banner line will appear, requesting for a username.

After the UNIX reads your username, it will usually prompt for a password and when both are entered correctly it will display a prompt.

```
Login: username
Password:
EV1#
```

The C shell (standard prompt = # (super user), here represented by EV1#) is ready to accept a command request.

To conclude this first session the command logout or a ^D (Ctrl D) is required. Sometimes the command exit is needed before the logout command.

```
EV1# logout
Login:
```

### 1.5.3. COMMAND LINE FORMAT

Because in the UNIX system there are several possible options and arguments for most commands, the command line format statement allows us to describe all possible command lines in general terms.

```
EV1# command [option...] [ argument...]
```

The use of brackets ([ ]) around an option or an argument indicates that they are not always required.

The three sequential points (...) indicates that there may be more than one option or argument.

The space character is used as a delimiter.

Examples:

```
EV1# date
EV1# who
```

Remark

The UNIX system distinguishes between uppercase and lowercase letters; an uppercase character is interpreted differently from the lowercase version.



### 1.5.4. ON-LINE DOCUMENTATION

This UNIX system has the on-line documentation so it is possible to get more information about a particular command. The **man** command displays information from the reference manuals. It displays complete pages about UNIX subjects.

The following options are supported:

- a** Show all manual pages matching name within the MANPATH search path. Manual pages are displayed in the order found.
- d** Debug. Displays what a section-specifier evaluates to, method used for searching, and paths searched by man.
- f file...** man attempts to locate manual pages related to any of the given files. It strips the leading path name components from each file, and then prints one-line summaries containing the resulting basename or names. This option also uses the windex database.
- F** Force man to search all directories specified by MANPATH or the man.cf file, rather than using the windex lookup database. This is useful if the database is not up to date. If the windex data base does not exist, this option is assumed.
- k keyword** Print out one-line summaries from the windex database (table of contents) that contain any of the given keywords. The windex database is created using catman(1M).
- l** List all manual pages found matching name within the search path.
- M path** Specify an alternate search path for manual pages. path is a colon-separated list of directories that contain manual page directory sub-trees. For example, if path is /usr/share/man:/usr/local/man, man searches for name in the standard location, and then /usr/local/man. When used with the -k or -f options, the -M option must appear first. Each directory in the path is assumed to contain subdirectories of the form man\*, one for each section. This option overrides the MANPATH environment variable.
- r** Reformat the manual page, but do not display it. This replaces the man - -t name combination.
- s section** Specify sections of the manual for man to search. The directories searched for name is limited to those specified by section. section can be a digit (perhaps followed by one or more letters), a word (for example: local, new, old, public), or a letter. To specify multiple sections, separate each section with a comma. This option overrides the MANPATH environment variable and the man.cf file. See each Paths below for an explanation of how man conducts its search.
- t man** arranges for the specified manual pages to be troffed to a suitable raster output device (see troff(1)). If both the - and -t flags are given, man updates the troffed versions of each named name (if necessary), but does not display them.

Some major parts of a man page:

**NAME**

lists the name or names that are used for the command as well as a brief one-line description of the command's purpose

**SYNOPSIS**

gives the general command line format for invoking the command

**DESCRIPTION**

explains in some detail the action of the command

**OPTIONS**

explains the different options of the command

**FILES**

if present, lists the file or files that are associated with the command program

**BUGS**

Basic commands UNIX system documentation

## Examples:

This demonstrates this facility, assume information is requested about the command "man".

```
EV1# man man
Reformatting page.  Wait... done
```

A full example is given for the command "pwd".

```
EV1# man pwd
Reformatting page.  Wait... done
```

<p><b>NAME</b> pwd - return working directory name</p> <p><b>SYNOPSIS</b> /usr/bin/pwd</p> <p><b>AVAILABILITY</b> SUNWcsu</p> <p><b>DESCRIPTION</b> pwd writes an absolute path name of the current working directory to standard output.</p> <p>Both the Bourne shell, sh(1), and the Korn shell, ksh(1), also have a built-in pwd command.</p> <p><b>ENVIRONMENT</b> See environ(5) for descriptions of the following environment variables that affect the execution of pwd: LC_MESSAGES and NLSPATH.</p> <p><b>EXIT STATUS</b> The following exit values are returned: 0 Successful completion. &gt;0 An error occurred.</p> <p>If an error is detected, output will not be written to standard output, a diagnostic message will be written to standard error, and the exit status will not be 0.</p> <p><b>SEE ALSO</b> cd(1), ksh(1), sh(1), shell_builtins(1), environ(5)</p> <p><b>DIAGNOSTICS</b> ``Cannot open .." and ``Read error in .." indicate possible file system trouble and should be referred to a UNIX system administrator.</p> <p><b>NOTES</b> If you move the current directory or one above it, pwd may not give the correct response. Use the cd(1) command with a full path name to correct this situation.</p>
---

### 1.5.5. OVERVIEW CONTROL KEYS

Key Function:

**Ctrl-U** erases entire command line  
**Ctrl-W** erases last word on command line  
**Ctrl-C** interrupts many programs and shell scripts  
**Ctrl-Z** suspends many programs and shell scripts  
**Ctrl-S** stops output of running program; prevents output from running off end of screen  
**Ctrl-Q** resumes output from program stopped by Ctrl-S  
**Ctrl-O** throws away output from program without interrupting the program  
**Ctrl-D** End-Of-File character used for logout; also terminates file input

### 1.5.6. FILE SYSTEM & TYPES OF UNIX FILES

The UNIX file system is a structure for organizing information or data. The data is grouped into named entities called files. The UNIX system recognizes at least three types of files:

1. Ordinary files\_This type of file is used to store data. Executable programs (commands) are also stored as ordinary files.
2. Directory files A directory file contains a list of files.
3. Special files\_These files are used to reference physical devices, such as terminals, printers, disks, and tape drives. They are read from and written to, just like ordinary files, but such requests cause activation of the associated physical device.

### 1.5.7. FILE ACCESS PERMISSIONS

There are three classes of file users and three modes of file access offering the UNIX file system a total of nine different kinds of access permission.

The three classes of system users are:

1. **Owner** - The owner is usually the system user who created the file. The super-user can change the individual ownership of a file if necessary. The owner has full control over restricting or permitting access to the file at any time.
2. **Group** - A system user who is not the file owner may access the file if this user belongs to the group of system users who are allowed to access the file. However, this user cannot restrict or permit access to the file; only the owner is allowed to do this.
3. **Other** - This category refers to any other user of the system.

There are three ways of accessing a file. The meaning of these access modes is somewhat different for ordinary files than it is for directories:

1. **Read** - Allows examination of contents Allows listing of files within directory
2. **Write** - Allows changing contents of file Allows creating new files and removing old ones
3. **Execute** - Allows executing file as command Allows searching directory

### 1.5.8. FILE FIELDS

File field have the following structure:

```
-rwxrwxrwx 1 root dev 10876 May 16 9:42 part2
```

Where:

“- The dash in the file type field indicates that the file is an ordinary file.

” Other possibilities:

D	the entry is a directory;
L	the entry is a symbolic link;
b	the entry is a block special file;
c	the entry is a character special file;
p	the entry is a fifo (or "named pipe") special file;
-	the entry is an ordinary file;
	the entry is a FIFO.

“rwxrwxrwx” The permissions are indicated as follows:

r	the file is readable
w	the file is writable
x	the file is executable
-	the indicated permission is not granted

Some examples of a file's permissions are:

```
-rwxr--r--
```

This describes a file that is readable, writable, and executable by the user and readable by the group and others.

```
-rwsr-xr-x
```

This describes a file that is readable, writable, and executable by the user, readable and executable by the group and others, and allows its user-ID to be assumed, during execution, by the user presently executing it.

```
-rw-rwl---
```

This describes a file that is readable and writable only by the user and the group and can be locked during access.

1 The number of links to this file

root The file owner

dev The group

10876 The size of the file in bytes for the special files, the device driver and number of units

May 16 9:42 The date and time when the file was last changed (modification time)

part2 The filename

**1.5.9. BASIC COMMANDS FOR FILE MANUPULATION**

<b>ls</b>	list the contents of a directory
- a	list hidden files
- l	describes the properties of each file
- s	give size of each file
<b>file</b>	determine the file type
<b>cat</b>	concatenate and display the file
- n	precede each line output with its line number
<b>more</b>	browse through a text file
<b>tail</b>	deliver the last part of a file
<b>cp</b>	copy a file
- i	prompt for confirmation
<b>ln</b>	creating filename aliases (link)
<b>mv</b>	move or rename a file
- i	prompt for confirmation
<b>rm</b>	remove a file
- i	prompt for confirmation

### 1.5.10. BASIC COMMANDS FOR CHANGING FILE ACCESS PERMISSIONS

**touch** update the access and modification times of a file  
**chgrp** change group, file ownership  
**chmod** change mode, file access permissions (absolute and symbolic mode)

u	user's permissions
g	group's permissions
o	others' permissions
a	all permissions (user, group, and other)

+	Add permissions.
-	Take away permissions.
=	Assign permissions absolutely.

Examples:

```
chmod ugo+r *
```

Changes user, group, and other to read of all files.

```
chmod go-rwx *
```

Nobody except for the owner can access all files.

**Chown** - change owner of a file

**Chgrp** - change the group ownership of a file

### 1.5.11. BASIC COMMANDS FOR DIRECTORY HANDLING

Protections:	r	Read	Example:	ls directory_name
	w	Write	Example:	rm file
	x	Execute	Example:	cd directory_name

#### **NOTE**

*Be aware with x and w permission file can be deleted, without file access permissions.*

---

<b>cd</b>	change working directory .. go to the parent directory
<b>cp -r</b>	copy files and subdirectories of a directory (source) to a second directory (destination), along with its files and subdirectory
<b>mkdir</b>	creates a directory -p allows missing parent directories to be created as needed
<b>rmdir</b>	remove a directory (only an empty directory)
<b>rm -r</b>	recursively delete the contents of a directory, its subdirectories, and the directory itself
<b>mv</b>	rename the source directory to the destination directory
<b>pwd</b>	display the pathname of the current working directory



## 1.6. VI EDITOR

starting vi: `vi filename`

**The VI editor has two modes:**

### The command mode

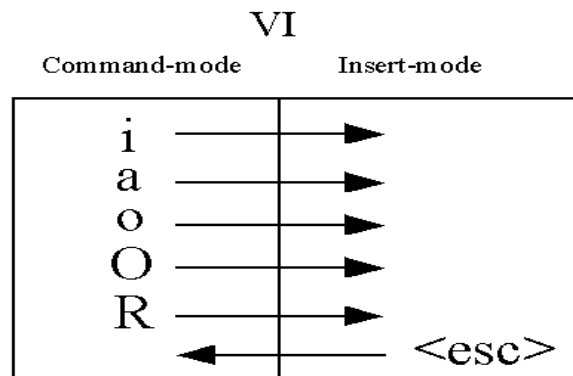
This is the initial mode upon entering "vi". In this mode the user has capabilities like moving the cursor, save file, and quit file.

stopping vi:	<code>:w</code>	save file
	<code>:w!</code>	overwrite existing file
	<code>:q</code>	quit without saving
	<code>:wq!</code>	save and quit
	<code>:q!</code>	quit without save
moving vi:	<code>h</code>	cursor left
	<code>j</code>	cursor down
	<code>k</code>	cursor up
	<code>l</code>	cursor right
	<code>space</code>	cursor right
	<code>w</code>	word forwards
	<code>b</code>	word backwards
	<code>+</code>	jumps to begin next line
	<code>return</code>	jumps to begin next line
	<code>-</code>	jumps to begin previous line
	<code>^</code>	jumps to begin current line
	<code>\$</code>	jumps to end current line
	<code>nG</code>	Goto line <i>n</i>
	<code>←</code>	scroll cursor left
	<code>↑</code>	scroll cursor up
	<code>→</code>	scroll cursor right
	<code>↓</code>	scroll cursor down

The insert mode

The user must be in this mode to be able to write.

To enter the insert mode:



i	Insert text before cursor
a	Append text after cursor
o	Open a line below cursor
O	Open a line above cursor
R	Replace/type-over a line
<esc>	Back to command mode

To re-enter the command mode simply press the <ESC> key. The screen will blink or beep, when already in this mode.

### 1.6.1. AN OVERVIEW OF VI EDITOR COMMANDS

/exp	Go forward to exp	hijkl	Unit cursor motion	a	Append after cursor
?exp	Go backward to exp				
n	Repeat previous search	G	Goto last file line	A	Append at line end
N	Reverse previous search	3G	Goto line 3		
		0	Goto line start	c	Change character
		\$	Goto line end		
:w	Write buffer to disk	H	Goto screen top	ow	Change a word
:w newfile	Write buffer to newfile	M	Goto screen middle		
:w >> file	Append buffer to file	L	Goto screen bottom	c3w	Change 3 words
:w!file	Write absolutely				
:q	Quit the editor	w	Go forward 1 word	C	Change line
:q!	Quit, discarding buffer	3w	Go forward 3 words		
:wq	Write buffer and quit	b	Go back 1 word	i	Insert before cursor
:x	Write if needed and quit	3b	Go back 3 words		
:f	Edit & file status			5i	Insert text 5 times
		n	Goto next occurrence		
:r	Read file into buffer	N	Goto previous occurrence	I	Insert at beginning of line
:r file	Read named file in				
:e	(Re)edit file	x	Delete 1 character	o	Open a line below cursor
:e!	(Re)edit file,discard buffer	dw	Delete 1 word	O	Open a line above cursor
:e file	Edit named file	dd	Delete 1 line		
		D	Delete to end of line		
:3,8d	Delete lines 3-8	d0	Delete to begin of line	r	Replace 1 character
:4,9m 12	Move lines 4-9 to 12				
:2,5t 13	Copy lines 2-5 to 13	dG	Delete to end of file	R	Replace/type-over a line
5,9w file	Write lines 5-9 to file	4dd	Delete 4 lines		
				s	Substitute a character
:s/old/new/	Current line, substitute first "old" with "new"	u	Undo last change		
		.	Do last change again	7s	Substitute 7 characters
:s/old/new/g	Current line, substitute each "old" with "new"	Y	Yank a copy of a line	S	Substitute a line
:3,9s/old/new/	Lines 3-9 substitute first "old" with "new"	5Y	Yank a copy of 5 lines		
		p	Put below cursor		
:%s/old/new/	All lines substitute first "old" with "new"	P	Put above cursor		
:%s/old/new/g	All lines substitute each "old" with "new"	J	Join next line to current		

---

## Section 9

## Additional Information

---

NOT APPLICABLE

